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The independent Dragon magazine

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How to submit articles
The quality of the material we can publish in *Dragon User* each month will, to a very great extent depend on the quality of the discoveries that you can make with your Dragon. The Dragon computer was launched on to the market with a powerful version of Basic, but with very poor documentation.

Articles which are submitted to *Dragon User* for publication should not be more than 3000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Programs should, whenever possible, be computer printed on plain white paper and be accompanied by a tape of the program.

We cannot guarantee to return every submitted article or program, so please keep a copy. If you want to have your program returned you must include a stamped, addressed envelope.

Contents



Cover courtesy Hewson Consultants

Editorial

AS DRAGON User goes to press, news is coming in about both Acorn and Sinclair.

A year ago, the Dragon was fading rapidly, and the BBC and Spectrum were both vigorous.

Then, nobody would have dared to predict that the two giants of the British home computer industry would face just the same sort of problems — but they are facing them.

Nor would anyone have cared to bet on the continued existence of the Dragon as anything more than a museum piece — but here we are, halfway through 1985, and the Dragon is still very much alive.

The Spectrum will survive, because of the vast number of games produced for it, and because over a million machines have been sold.

The BBC B will live on, because of the large number that have been brought for use in education.

The Dragon, too, is a survivor — the strengths of the 6809 will ensure that.

Certainly the recent news bodes ill for the British micro computer industry — but at least Dragon owners will no longer find that the collapse of Dragon Data is taken to mean that the Dragon micro is in some way at fault.

Letters

This is the chance to air your views — send your tips, compliments and complaints to Letters Page, *Dragon User*, 12-13 Little Newport Street, London WC2H 7PP.

Pam's point

WHILE having a certain amount of sympathy with Anthony North (June Letters), I am grateful that half of the magazine *is* devoted to advertisements.

Without the advertisers, there would be no *Dragon User* at all, and then where would we be?

What I find more worrying is the non-readership. None of the Dragon users I know personally buy the magazine more than occasionally.

With more and more software outlets drying up, perhaps people will be forced into buying *Dragon User* — then with more sales will come more pages, and the proportion of adverts may not look so large.

Long live *Dragon User* and Dragon Suppliers.

Pam D'Arcy
High Wycombe
Bucks

Vox Cumana

I HAVE a Dragon 32 with a Cumana twin disk drive and no software. Can anyone out there tell me if it is possible to convert *Pro-File* from Cable Software to run on my system, and how? Also is anyone selling a database that will run on my system?

K Beaumont
Rainworth
Notts

Peaksoft piqued

IN THE June edition, Brian Cadge answered an enquiry from a reader who was experiencing difficulty in running his Dragon 32 version of *Tim Love's Cricket* on a Dragon 64.

The original issue of *TLC* would run only on the 32, and we therefore kept a small stock of amended copies for mail order customers who informed us that they had a 64, and to exchange for customers who bought the incorrect version from other outlets.

However, every copy of *TLC* (and every other Peaksoft game) which has been supplied since mid-December, 1984 has been fully compatible with the Dragon 64.

Although your reader could, as Brian suggested, edit his Dragon 32 version to make it suitable for the Dragon 64, he is quite likely to have difficulty in persuading it to run unless he contacts us for guidance, and if he would care to return it to us, we would be pleased to exchange it for a later issue copy.

Harry Whitehouse
Peaksoft
48 Queen Street
Balderton
Newark NG24 3NS

DOS thanks

FINALLY my two year subscription to *Dragon User* has paid off. Thank you for your article about Dragondos in the May issue. We really do need information about this fascinating and undocumented piece of software.

Please publish more about it!

A Kotanski
Jaggellonian University
Institute of Physics
Krakow 16
Reymonta 4
Poland

Flex fan

I WRITE to protest on two fronts. Firstly the letter from Anthony North, June issue, complaining at the price of *Dragon User*. Pam D'Arcy's article with details of a Dissassembler is worth a year's subscription. Please Pam tell me how to do a print out!

My second protest is the unfair way in which Brian Cadge reviewed *Flex*. It is obvious to me that he did not study his subject enough. I first purchased *Flex* from Premier, and it was very poor, but when Premier closed down I was given a great deal of help by Compusense, and I now have a very good *Flex* system.

Brian seems to have missed most of the goodies on *Flex;* for instance the Utilities Disk provides many useful aids, like Filemap, which gives full memory details of any file, and if required a complete dump of the file. There is also a very good Dis-assembler and Dir(ectory) giving Date at which each file was made also start and end of file. There is also a lot more. I am not a very good programmer but I could fill several pages of Dragon User with details of *Flex*.

H McDonald
9 Loxwood Close
Little Common
Bexhill-on-Sea
East Sussex

FOR H McD and other Flex fans, we will have Flex Revisited by Roy Coates — see next month's issue.

Miner problem

I AM writing to enquire about the Star Game (Moon Miner) in June's *Dragon User*. After spending a few hours putting the program in I found that it would not run. I tried it again and all I got on the screen was M/C DATA ERROR. No matter what I did I could not get the program to work.

I was wondering if you could tell me if there was anything wrong with the program because if not it could be my computer as I have had trouble with it in the past.

Jayne Louthian
Lemington
Newcastle Upon Tyne

M/C DATA ERROR means that you have made a mistake typing in the data statements. The listing published was absolutely correct, according to Steve Gathercole.

If you have any further problems, Steve has very kindly offered to help any readers who need it — write to him at 16 Hankinsons Estate, Walpole St Andrew, Wisbech, Cambs. Remember to enclose a stamped self addressed envelope!

Good service

A SHORT while ago we recently had a problem with our DRAGONDOS where it refused to list the items — as a result the system was useless.

The ribbon cable looked as if it could be at fault and we tried everyone we could think of but were unable to get a replacement — even Dragon themselves couldn't help. But — on phoning Compusense they had one!

However, after they checked the new cable with our equipment it was apparent that this was not the cause of the trouble. Although not Service Agents, Compusense suggested we left our equipment with them and they would try and ascertain the cause of the trouble. They found it to be of mechanical origin, and promptly put it right.

The point I wish to illustrate is that not only are Compusense good on software for the Dragon but they also offer courteous attention to Dragon users who have a problem. This cannot be said of many firms today.

J L Wood
Enfield

Delta

USERS OF the DELTA DOS may be interested in a useful poke that switches off the DOS to allow long BASIC programs to run without OM errors.

Load the program from tape and insert at the beginning of the program the following;

```
POKE 377,57:CLEAR
200,&H7FFF
```

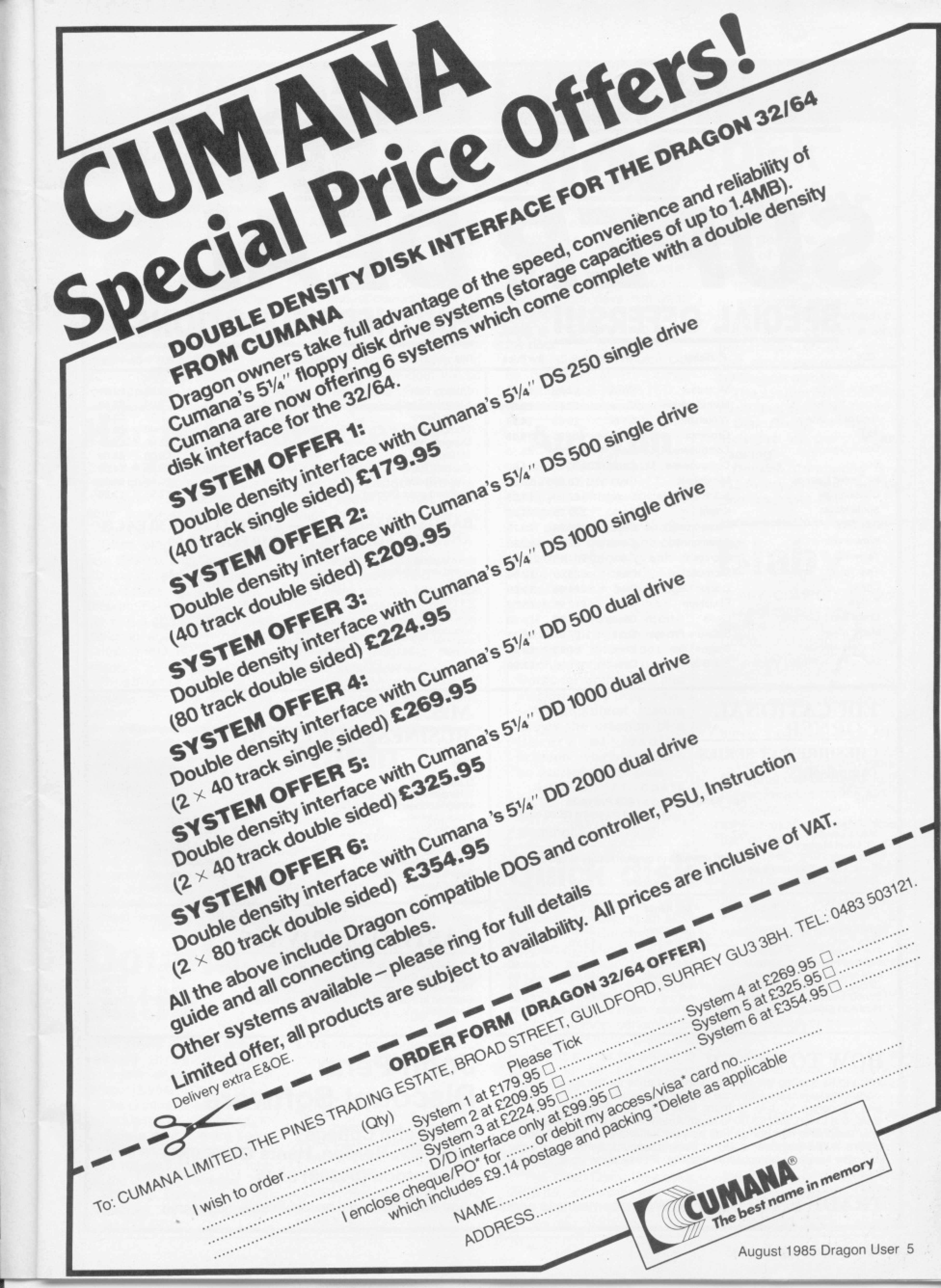
If the program contains a CLEAR statement than just type in the POKE. Now save to disc with SAVE "filename". This pole will disable all of the extra DOS commands so any attempt to use disk files will cause an SN error. If the DOS workspace was not overwritten when running the program then the DOS can be reenabled with;

```
POKE 377,126: CLEAR
200,&H78FF
```

In this way programs such as *Dragon Trek, Wizard Wars, Pettigrew's Diary* and *Up Periscope* will all now load and run from disc.

How about an article on the DELTA DOS since it seems to me that there is rather too much coverage given to the somewhat inferior DRAGONDOS system.

S Neville
115 Ifield Way
Gravesend
Kent DA12 5TX



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TRADE ENQUIRIES We welcome trade enquiries and each order will be individually negotiated.

News desk

If you have any new products for the Dragon — software or hardware — ring the News Desk on 01-437 4343

Third 6809 Show

THE THIRD 6809 Show will be held on Saturday 23 and Sunday 24 November, 1985, at the Royal Horticultural Society's Old Hall in Westminster, London.

Tim Collins of Computer Marketplace, the organisers, believes that the show will be even more successful than the first two — "two thirds of the stands have already been taken, and we have had enquiries about the remainder."

Among the companies which have already taken space are Compusense, Tandy, Cumana, John Penn Discount Software, Software Projects and, of course, Sunshine Publications, publishers of *Dragon User.*

The doors will be open from 10 am to 6 pm both days, and admission on the door will be £3 for adults and £2 for children. But Tim Collins pointed out that you can also buy advance tickets at a saving of £1 off the price on the door. Booking in advance will also save queueing — there was a two-hour wait on both days last year! Advance ticket holders will be able to avoid any hold-up on the door.

Computer Marketplace can be contacted at 20 Orange Street, London WC2H 7ED.

Harris boxing clever

THE LATEST release from Harris Micro Software is a set of integrated accounting programs designed for use with Dragondos.

Three programs — *Salesbox, Billsbox* and *Cashbox* — are due for release in August.

Salesbox is a Balance Brought Forward Sales Ledger with a number of features including aged debt periods, sales analysis and statements.

Billsbox is a Balance Brought Forward Purchase Ledger.

Cashbox is a Double Entry Nominal Ledger program which allows the user to produce trial balances, balance sheets, profit and loss summaries and so on.

In addition, *Cashbox* car read *Salesbox* and *Billbox* files, and use the information in its own program.

All three programs cost £19.99 each, and will soon be joined by programs dealing with invoicing and stock control. Harris Micro Software is at 49 Alexandra Road, Hounslow, Middlesex.

Autorun

DATACOM has just released *Autorun 11,* a utility package for the Dragon 32.

It enables users to design their own eight colour text or block graphic loading screens, and autorun their own programs.

It features a menu driven program, and needs no knowledge of machine code to use. It works for both Basic and machine code programs.

An additional feature allows the creation of a library of loading screens, which can then be used at a later date.

***Autorun 11* costs £3.95, from Datacom, 407F Hockley Centre, Birmingham B18 6NF.**

Plus plus

ANDTEK Data Design has just written three HiRes screen sets for its *Plus* interface. The new screen sets will be supplied free to Plus users, to demonstrate the company's continued support of the 32.

Andtek is at 41 Pebworth Road, Harrow HA1 3UD.

Double entry

SOFTWARE Design has released three business accounts programs for the Dragon 32/64.

The programs can be used individually, or combined to provide a double entry bookkeeping system which will produce results that you can take to the Inland Revenue.

Software Design is at 80 Woodroyd, Golcar, Huddersfield HD7 4PR.

Robin

MICRODEAL is doing very well with its new Pocket Money range, according to company spokesman Alan Hobbs.

"All the games in the series are programs sent in by British programmers — these were the ones we though were good enough to develop further," Alan Hobbs said. "They are aimed at soaking up pocket money — £8.00 is a lot of money for a game."

The best selling title is apparently *Robin Hood,* in which the player has to rescue Maid Marian from the clutches of the evil sheriff.

Other games in the series include *Pit Fiend,* a *Sabrewulf* type maze game, *Bandito,* a fruit machine simulation, and *Fearless Freddy,* a *Manic Miner* type game.

Microdeal is at 41 Truro Road, St Austell, Cornwall PL25 5JE.

Quick disk

RADOFIN Electronics, which has been developing an MSX system for Eurohard, the Spanish manufacturers of the Dragon, has just released a floppy disk drive compatible with the Dragon 64.

Called the Triton Quick Disk, it is almost certain to be the same Quick Disk that Eurohard will be marketing in Europe under the Dragon trade name.

Files load from the 2.8" double sided diskettes in a minimum of two seconds, and a maximum of eight, according to Radofin.

The Triton Quick Disk costs £119.95, including an interface box and all connecting cables and instructions.

Disk Doctor

DISK Doctor is the first product of a new company, Domino Computing.

The disk contains a largely automatic series of utilities and functions which are designed to correct a large percentage of disk errors and problems encountered by Dragon owners.

The system can cope with multi disk configurations.

***Disk Doctor* costs £14.45 inclusive of postage and packing.**

Domino Computing is at 112 Priory Avenue, Taunton, Somerset TA1 1YB.

Blaby

BLABY COMPUTER Games has a number of new releases for the Dragon and Tandy CoCo, including the company's first graphic adventure, *Sword and the Sorcerer.*

Sword and the Sorcerer is a menu driven adventure in which the player has to retrieve the three parts of a mystical key.

Various items dotted around the game can be useful to the player in defeating the lurking monsters — without the mirror, for example, the Medusa can be fatal.

Another Blaby game is *Caverns of Chaos,* a *Manic Miner* type platform game with 20 screens. The key word Piglet will allow players access to any of the screens so that they can practice.

Fingers is a game about a safe cracker. It features 13 screens full of the usual hazards — disappearing floors, conveyer belts, and so on.

Gis a Job follows the adventures of a young programmer trying to get to Blaby Towers to get a job. There are various obstructions, including chickens and police cars, which our hero can head butt if the right object has been collected. All the games cost £3.99 from Blaby Computer Games, Crossways House, Lutterworth Road, Blaby, Leicester.

Dragonsoft

New software for review should be sent to *Dragon User*, 12-13 Little Newport Street, London WC2H 7PP.

Football

Program: *Football Manager,* Addictive Games, 7a Richmond Hill, Bournemouth, Dorset BH2 6HE
Price: £5.95

AS A person with very little experience of football I was rather perplexed as to how to approach this program.

The first time I played it I was not particularly impressed, but when my football supporter friend came round I loaded it up to show him, with the result that he was immediately engrossed, and, subsequently, I have become highly addicted myself.

The game lets you manage any of a choice of 32 football teams, with all the inherent trials and tribulations of the task.

This is NOT a quick game that you can load up when you want a break from the revision — load this one up and you won't finish till after the exam!

Having picked your team you can choose to sell any of your players, obtain a bank loan, save the game (which I have had limited success with!), re-load an earlier game, or go on to play a match.

If you decide to go into the match you are shown your team's average attributes, along with those of the opposition, at which point you can re-arrange your players, taking out those with low energy and so on, and inserting others.

When you are happy with the changes that you have made the game starts and a running score is printed up as the game progressses (sadly there is no option to re-arrange the team at half time as there appears to be no half time in the game).

The league table and results of other league matches are shown, along with your finances for the week, and the game returns to phase one.

This process repeats for 14 league matches and however many FA Cup rounds you play. I have only won the FA Cup once but I can recommend doing so for purely financial reasons, I believe my share of the gate was one hundred thousand pounds.

Players are denoted as attackers, defenders, or midfield players, and are allotted certain attributes under skill (1-5) and energy (1-20). They are then valued at a level based upon their skill, and all the information can be called up in tabular form by the touch of a button.

To sum up then, the game is a definite for anyone with a love of football. If you are not of that ilk, but still like the sound of the game, then I would recommend it as it is programmed neatly and plays well.

Jason Orbaum

Amoebae

Program: Home Base, Cable Software, Freepost, Luton, Beds LU3 2BR. **Price:** £6.95

I CAN remember some time ago now, peering down a microscope in the biology laboratory at school and watching amoebae swimming around aimlessly, occasionally absorbing some tasty piece of material that happened to float their way. Home Base is a bit like that, only the amoebae are renamed laser balls, and you control a laser dome that moves amongst them, firing to the left and right.

A joystick is used to control movement, and it is important to avoid touching the laser balls, as your energy level drops when this happens. You have three domes to start with, and in the slow version of the game you can hide in the home base until there is a space to move in. The time you can remain in the home base is limited, and in the fast version of the game, this option is not even provided.

The playing area is surrounded by a wavy line which increases the similarity to a cellular organism. This proves lethal if you inadvertantly collide with it. After seeing some rather good programs from Cable Software, I was a little disappointed with this game. I wasn't really very impressed with it and I think it would soon become very tedious. The display remains more or less the same throughout the game, and it's not too difficult to avoid the laser balls, even in the fast mode. Once you clear one screen, it fills up with more laser balls, and so on, and so on.

Perhaps I've come to expect too much from Dragon games nowadays, but unless you're heavily into microbiology, this is hardly one you'll come back to again and again.

John Scriven



Combat Air Patrol

Program: *Combat Air Patrol,* Vidipix, 125 Occupation Road, Corby, Northants NN17 1EG.
Price: £3.95

WITH SEVERAL flight simulators already available for the Dragon, it's interesting to check out a new one and see how it compares with the rest, though unfortunately *C.A.P.* doesn't compare too well. It's fairly comprehensive but is mostly in BASIC and so lacks a certain speed and excitement.

There are three phases you can choose from: Patrol, Landing and Refuelling. You begin in Patrol mode, though curiously your undercarriage is down despite the fact that you're travelling at over 500 mph and at almost 3,000 feet. It's when patrolling that the combat sequences take place, with enemy aircraft appearing at random in your front sights or rear view mirror (or rear *veiw* mirror as the notes spell it). To deal with these you have 90 cannon and two missiles, though the sound and graphics are both rather tame unfortunately.

Pressing 'R' takes you into the refuelling sequence, where you're told the heading, height and speed you must attain before being allowed to try to line up your Tornado with a tanker in a separate little graphics sequence.

The Landing routine also gives you a heading and height to aim for before you can bring your Tornado (now a pixel) down in the Landing Screen at bottom left of the main screen. This main screen gives you all the readouts you need, including altitude, fuel supply, speed and heading, though the heading is simply the eight compass points rather than a specific bearing. There is no factor for pitch, you're always deemed to be flying level apart from when landing, and to play *C.A.P.* you need two joysticks — one acts as the throttle, the second as flight controls. Very complicated.

A lot of programming effort has obviously gone into the software, but the responses are just too slow to make it enjoyable — descending from 2,500 feet (at which height the combat sequences come into effect) down to a suitable height to commence landing takes forever. An interesting exercise for the programmer, but nof for the potential buyer when better stuff's available from the likes of Hewson and Microdeal.

Mike Gerrard



Printer Control

Program *Printer Control,* MacGowan Consultants, 6 Arnhem Drive, Caythorpe, Lincs NG32 3DQ.
Price £15

MacGOWAN Consultants is a new name to Dragon software and if their first offering is anything to go by then it is a name that is going to become quite familiar. *Printer Control* can best be described as a powerful wordprocessor with even more powerful control of how the text is printed.

The hefty instruction manual gives some clue to the power or the software — the whole text was prepared using a standard version of the program. *Printer Control,* which is written entirely in machine code, autoruns on loading and automatically adjusts itself to work on either a Dragon 32, or a Dragon 64 in 32k or 64k mode. It is certainly nice to see at last some software arriving which takes advantage of the extra RAM when it is available. With 32k you get 10.5k free for your text files, and with 64k you get 26k. On a

Dragon 64, in 64k mode only, the serial printer is supported with the baud rate set at 1200. The program will not allow you to use the serial port on a 64 in 32k mode. (Why!?).

The first thing that greets you is a menu of 11 options. These allow you to save, load and merge text files or enter one of the program's other modes. Selecting the EDIT mode changes the screen to a 42×24 column display. The lower two lines are used for prompts and commands. The program is very user friendly and always prompts for the next type of command required. In this mode the keyboard has autorepeat on most of the keys. Unfortunately the delay before a key starts to repeat is much too short for all but the best touch typists, and after a while it becomes frustrating to have to keep deleting the extra characters typed.

The character set supplied for the 42 column dispay in not particularly clear and falls short of that offered by other packages, such as Compusense's *HIRES* program, despite the fact that it is only 42 columns rather than 51 columns wide. There is no on screen wordwrapping or formatting, this is all done on the printout only.

The usual sort of cursor controlled screen editor commands are available, such as insert, delete, find and change, as well as block move, copy and delete. A powerful feature is the option to have up to nine user defined strings. These could be a phrase or word that is to be used often throughout the text, or a command string to, for example, centre the line.

Another rare feature is the 'Address Block'. This is a number of lines enclosed between the ESC-AB and ESC-AE characters (ESC is obtained by using shift+right arrow). These lines will be printed as a formatted address on the right of the paper. This is a useful option and eliminates a lot of mucking around with the cursor. All of the print format commands, such as centering of text, underline and formfeed, are entered as one or two letter commands following the ESC character. The effects of the command are not shown on the screen.

The big difference between this program and just any decent wordprocessor is its control over Epson type printers with graphic modes. Text can be printed in normal size or two, four or eight times normal size, in two character sets, with the option to define your own characters. The printers' bit image mode is used for this, so printouts can take quite a while. Graphics characters can also be printed.

The *Printer Control* program handles all the complicated business of sending the right graphic codes to the printer — all it needs to know are the appropriate control codes for your particular printer to enter bit-image mode, enlarged and condensed modes and so on. These can all be changed to suit your printer using the first option on the main menu. It is worth pointing out, however, that the program is only compatible with printers that use the Epson type, 8 bit wide, graphic mode —it will not work with the 7 bit vertical graphic mode type of printer.

Finally, not content with being a powerful wordprocessor, Printer Control has a 'Picture Mode' which allows you to edit PMODE 4 screens, loaded in from tape. The picture can be scrolled a single pixel at a time in all four directions, text can be added to it, and blocks of it (8×8 pixels) can be rotated through 90 degrees. All of this is done on a copy of the loaded screen so the original is quite safe until all the changes are complete and the mode is exited by pressing Break. The screen can then be resaved to tape, or dumped to the printer in one of four sizes, horizontally or vertically.

Printer Control is a program anyone with a suitable printer should not be without, as at £15 it represents very good value for money indeed. A free advice and information service is provided for registered owners of the software, so support is guaranteed. A special version of the program will soon be released which is aimed primarily at correspondance work, giving double density bold type, and one pass right justification for faster print outs. This version will again be priced at £15. It would be nice to see a disk version of the program produced as this could offer much larger text files.

Brian Cadge



Poor fuels

Program: *Dickie Spaceman*, Quickbeam Software, 67 Old Nazeing Road, Broxbourne, Herts, EN10 6RN. **Price:** £6.95

AT THE recent 6809 show I spoke to Quickbeam, and found them a pleasant company, who knew that their games were not original, and were proud of it! I liked them!!

This is their version of a certain Spectrum game which involved a man jetting around on alien planets, and collecting fuel for his spaceship.

There are five different alien types, several space-ships, and a difficulty level which controls how many aliens appear on a planet.

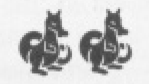
The scenario is this. There exist, somewhere in this amazing and expanding universe, planets where pieces of turf are free floating. You land on many of these planets, and must basically catch the fuel that precipitates from the top of the screen and load it on to your spaceship until, when your ship is full of fuel, you board and take off

To aid you in this task you have your handy jet-pack strapped to your back, and your super neutron blaster held in your hands to slaughter mercilessly any aliens that might happen to get in your way.

The game plays awfully and looks worse. The troubles with it are, in order of importance, 1) It's too fast! 2) It's too jerky! 3) The graphics are nowhere near as good as the Spectrum version (and there is NO excuse for that!) 4) Every time you play or land on a planet you have to hear the overworked strains of the Star-Wars theme. (It occurs to me that if John Williams ever claims royalties from all the various companies that use his theme, he will make another fortune!)

I am sure that many software lemmings will rush out and buy this game, despite my warnings to wait for a better version to be available, but then, what can you do?

Jason Orbaum



Dickie's dented

Program: *Dickie's Den*, Quickbeam Software, 67 Old Nazeing Road, Broxbourne, Herts, EN10 6RN. **Price:** £6.95

YES, IT'S good old Quickbeam back again for another friendly helping of fun. This time, the game involves walking a man around a mansion, collecting bits of masonry, and avoiding such items as boots, watering cans, and other such hilarious items!

This game is very similar indeed to another game reviewed last issue (Subtle Clue: *Jet Set Willy*). So how does it compare?

The answer is . . . very badly. This game lacks all of the flair of its elder (and better). The game is once again jerky, too fast (although a variable speed option is available), and plainly amateur.

The graphics are not animated, they just jerk from one group of eight pixels to the next, and then back again. The man moves awkwardly, jumps unreliably (although that could be due to faulty joysticks) and generally is difficult to control.

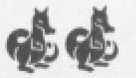
The 'tune' in the background is a composer's nightmare, comprising of several discordant notes played in slow succession for ever — very dull!

When (or if), you finish *Jet Set Willy*, then this game could be worth a go as although I have been rather cruel, it could be a lot worse.

One question arises: what is it about the programmers of these games that leads them to name their characters in this way? We now have a Miner called Willy, and a construction worker called Dickie. My heart pounds at the thought of the name of the next clone . . .

It is sad for Quickbeam that Software Projects has just released *Jet Set Willy*, as otherwise they would have had a winner, but as it is, they just have second place, and by more than a length.

Jason Orbaum



Semigraphics 24

*Ever wanted to design colourful screen displays — with text as well? **A C Daniel** shows you how*

IF YOU want to make up an elaborate screen display using all nine colours with text but with high resolution then this program is for you.

The resolution of S.G.24 is 192 × 32 so your fine artwork will consist of thin horizontal strokes, although for speed you can paint in thicker blocks including all the low resolution graphic blocks and the picture can be saved on tape at any time.

Once the computer is set to produce S.G.24 the screen cannot be altered so all the instructions have to be written out separately. So here they are — quite a lot I'm afraid, but I think you will find the flexibility and ease of use of the program well worthwhile. Apart from the initial input of the clearing colour all the commands are made by pressing a single key. A fairly long press is required, however, as there are a lot of alternatives for the computer to scan.

One problem of using S.G.24 is that it takes a lot of time to clear the screen in any colour except orange (8); so it is wise to use the clearing process to establish the main foreground and background colours.

Clearing the screen

Clearing begins in the colour commanded by entering the standard colour number as soon as the program is run. To change the colour or stop the clearing press ",". This slows down the display and accesses other commands. You may now press "D" to stop the clearing (at the end of the current line) or press the number of the colour you wish to change to, to restart the current line in that colour.

To re-speed up the clearing (bypassing the above commands) press "/".

You may also clear all or part of the screen at any time by pressing CLEAR. In this case the clearing will start from the position of the cursor in the currently requested colour.

Drawing

On completing the clearing you will see a flashing cursor in the top left-hand corner. This can be moved with the arrow keys in two ways:

1 Constructively, printing in the colour of your choice by pressing "@" and the number of the colour you require;

2 Non-destructively by pressing "/" before moving it.

You may also move the cursor diagonally by pressing "Z" (to bottom left), "X" (to top left), "N" (to top right), "M" (to bottom right).

The second cursor

A second cursor can be introduced by pressing "C". This can be moved with the arrow keys and then established in fixed position in relation to the first cursor by pressing "V". It can be moved constructively or non-destructively just like the first cursor and has a number of uses:

1 Used with the first cursor you can use it as a copying tool;

2 Press ":" and the space between the two cursors will be filled either by a **horizontal line** if the cursors are on the same level, by a **vertical line** if one cursor is on the top of the other.

In all other cases when the second cursor is lower than the first the space between them will be coloured.

To cancel the second cursor press "B". Note that if ":" is pressed when ony one cursor is in use the remainder of the horizontal line is filled with the current colour.

To write text

Press "-" and then type in the required characters. Only standard non-inverted text can be used and each character is printed so that it falls on to the nearest correct low resolution (PRINT@) position.

To leave text writing press "/".

To write one line below another it is necessary to move the cursor 12 spaces downwards.

Setting specific cursor positions

Pressing "I" restores the cursor to the top left-hand corner.

Pressing "Q" memorises the current cursor position and this can be returned to by pressing "W" whenever necessary.

The second set of commands

By pressing the spacebar you can scan a second set of commands and a black box appears at the bottom right corner to mark that you are doing this.

The number keys now refer not to colours but to the thickness of the line you draw — anything from one to seven lines thick. If you press nine, however, you get a standard low resolution graphics block correctly positioned as in text writing. The letters Q,W,E,R,T,Y,U,I,O,P and A,S,D,F,G,H,J,K,L,; give you all the different sorts of graphic block. The most important are Q which gives a BLACK block and A which gives a plain colour one. Try the others out using a special test routine which will automatically move the cursor from left to right drawing out full size graphic blocks which can be changed by pressing the appropriate key. Press "0" to start the test and "8" to cancel it.

To return to the original set of commands press ".".

When drawing diagonally a block can be drawn with the cursor either at the top or bottom of the previous block. The normal position is at the top so that each subsequent block starts one line above or below the previous one. To move the cursor to the bottom return to the first set of commands and press "L". The only keys that can be used to move the cursor after pressing L are Z, M and ↓. The others produce anomalous results. To cancel "L" press "K".

Tape saving

To save your design on tape press "T". A T appears at the bottom right corner. If you accidentally press T you may cancel it by pressing "/".

Otherwise press "R" to record or "S" to search for a design. The listing does not contain MOTOR ON or OFF so you must either set the tape recorder going manually or you can add in the commands (Lines 1660-1770).

When the tape process is finished the cursor begins to flash again. Having a pre-saved clear screen is in fact the quickest way of starting a new design.

Printing

The printout has been designed for a four-colour printer plotter such as the CGP115. Press ENTER and a P appears at the bottom right corner. If ENTER is accidentally pressed it may be cancelled by pressing "/". Otherwise press P to proceed.

Text is handled first. The printout is extremely slow but to speed up as much as possible it will proceed no lower than the lowest point the cursor has reached and scan no colour above the highest colour number that has been used in the drawing. If you wish a printout use only the first four colours and black (yellow is left as white).

If you load a program from tape to print out directly you must move the cursor to the lowest point you need to print out and press the colour number of the highest colour used. The printout can only handle plain coloured graphic blocks, but it would be too complex to avoid this limitation.

The listing

I have put REM lines in to guide you and there is also a tape saving routine. Type this in first and RUN10000 to operate it.

Having given so many instructions I only wish to make one point about the listing. It was done with a Toolkit cartridge which makes copying similar lines very easy. If you do not possess this you may prefer to put groups of peeks into loops such as: FOR A=1 TO 10: IF PEEK(P(A))=Q(A) THEN C=T(A): NEXT A having previously read your variables P(A),Q(A) and T(A) from DATA. Don't forget to DIM them either. Lines suitable for this treatment are 340-420, 1820-1890, 2030-2090 and 2120-2310. The longer and rather repetitive listing does make it easier to understand the function of each line, however.

```
5 ' "SEMIGRAPHICS 24" BY A.C.M. DANIEL
10 ' GENERAL SET UP
20 CLS: P=PEEK(1024):PRINT:PRINT:PRINT:PRINT"ENTER CLEARING COLOUR NO.":INPUT EH
30 POKE144,3
40 DIMLX(100),LE$(100),LY(100)
50 DIMBM(14)
60 DH=1:M=160: R=15:C=3: PZ=0: CK=EH*16: IF CK=0 THEN CK=1
70 CLSEH: AH=1536: E=EH
80 PMODE4,1: PCLS1
90 POKE65472,0:POKE65475,1:POKE65477,1
100 IF EH=8 THEN 160
110 ' SCREEN CLEARING
120 I=AH
130 IF PEEK(342)=253 OR DX=1 THEN 1780
140 POKEI,CK+127
150 I=I+1: IF I>7168 THEN 160 ELSE 130
160 ' SCREEN SEQUENCE 1
170 FE=PEEK(1024+511)
180 F=PEEK(1024+511)
190 GOSUB960: GOSUB2470
200 IF PZ=1 THEN POKE1024+X,CF
210 IF PZ=2 THEN POKE1024+X,CG
220 IF PZ=3 THEN POKE1024+X,CH
230 IF LA<>0 THEN POKE1024+X+LA,CH
240 IF PZ=0 THEN POKE1024+X,CF
250 IF YT=1 THEN 330
260 IF PEEK(341)=223 THEN DL=0:GOSUB1560:X=X-32: GOSUB960: GOSUB1590:GOTO680
270 IF PEEK(344)=223 THEN DL=0: GOSUB1560: X=X+1: GOSUB1020: GOSUB1590:GOTO680
280 IF PEEK(342)=223 THEN DL=0:GOSUB1560: X=X+32: GOSUB960: GOSUB1590:GOTO680
290 IF PEEK(343)=223 THEN DL=0: GOSUB1560: X=X-1: GOSUB1020: GOSUB1590:GOTO680
300 IF PEEK(340)=253 THEN PZ=2:GOTO680
310 IF PEEK(345)=253 THEN PZ=0: GOTO680
320 IF PEEK(338)=251 THEN PZ=1:GOTO680
330 IF DI=1 THEN GOTO2020
340 IF PEEK(338)=254 THEN C=0: M=113:R=15: GOSUB800:GOTO680
350 IF PEEK(339)=254 THEN C=1: M=128:GOSUB800:GOTO680
360 IF PEEK(340)=254 THEN C=2: M=144:GOSUB800:GOTO680
370 IF PEEK(341)=254 THEN C=3: M=160:GOSUB800:GOTO680
380 IF PEEK(342)=254 THEN C=4: M=176:GOSUB800:GOTO680
390 IF PEEK(343)=254 THEN C=5: M=192:GOSUB800:GOTO680
400 IF PEEK(344)=254 THEN C=6: M=208:GOSUB800:GOTO680
410 IF PEEK(345)=254 THEN C=7: M=224:GOSUB800:GOTO680
420 IF PEEK(338)=253 THEN C=8: M=240:GOSUB800:GOTO680
430 IF PEEK(342)=239 THEN MK=84:GOSUB2510:GOSUB1660
440 IF PEEK(339)=247 THEN GOSUB1560: X=0:GOSUB1590: GOTO680
450 IF PEEK(339)=239 THEN XK=X
460 IF PEEK(345)=239 THEN GOSUB1560: X=XK:GOSUB1590: GOTO680
470 IF PEEK(345)=223 THEN MK=128: GOSUB2510: DI=1: AC=C
480 IF PEEK(342)=247 THEN B=1
490 IF PEEK(341)=247 THEN B=0
500 IF PEEK(338)=223 THEN DL=0: GOSUB1560:X=X-33: GOSUB960: GOSUB1590:GOTO680
510 IF PEEK(340)=223 THEN DL=0: GOSUB1560: X=X+31: GOSUB960: GOSUB1590:GOTO680
520 IF PEEK(344)=247 THEN DL=0: GOSUB1560: X=X-31: GOSUB960: GOSUB1590:GOTO680
530 IF PEEK(343)=247 THEN DL=0: GOSUB1560: X=X+33: GOSUB960: GOSUB1590:GOTO680
540 IF PEEK(344)=253 THEN GOSUB2570: DI=0: C=AC
550 IF PEEK(343)=253 THEN GOSUB1060:GOTO680
560 IF PEEK(341)=251 THEN GOTO570 ELSE 590
570 IF PZ=3 OR LA<>0 THEN GOTO680
580 IF PEEK(341)=251 THEN PZ=3: IF X=V+1 THEN 590 ELSE V=X: X=X+1
590 IF PEEK(344)=239 THEN GOTO600 ELSE 630
600 IF LA<>0 THEN GOTO680
610 IF X=V GOTO190 ELSE 620
620 L=X: X=V: PZ=0:LA=L-X: POKE1024+X,F: L=0: GOTO190
630 IF PEEK(340)=251 THEN L=X:POKE1024+X+LA,FE: LA=0: V=0: PZ=0: POKE1024+X,P
640 IF PEEK(339)=191 THEN 650 ELSE 670
650 AH=X+1024
660 EH=C:I=AH:GOTO100
670 IF PEEK(338)=191 THEN POKE1024+X,(M+R): MK=80:GOSUB2510: GOSUB1220
680 IF YT=1 THEN GOSUB2640
690 IF PZ=1 AND DH>1 AND DL=0 THEN 700 ELSE 720
700 IF DH=12 THEN GOSUB2360
710 GOSUB2370
720 IF PZ=1 THEN POKE1024+X,(M+R)
730 IF LA<>0 THEN POKE1024+X+LA,FE
740 IF PZ=0 OR PZ=3 THEN POKE1024+X,F
750 IF PZ=2 THEN GOSUB820
760 P=PEEK(1024+X)
770 IF Z=1 THEN 780 ELSE 790
780 FOR H=1 TO 400: NEXT
790 GOTO190
800 IF C>E THEN E=C
810 RETURN
820 IF LA>0 THEN 830 ELSE 850
830 L=X+LA: GOSUB1620
840 GOTO890
850 MX=X
860 IF MX>6111 THEN L=6144: GOTO890
870 MX=MX+1: IF (MX+1)/32=INT((MX+1)/32) THEN L=MX: GOTO880 ELSE 870
880 ST=1
890 FOR JX=X TO L STEP ST
900 POKE1024+JX,(R+M)
910 FE=PEEK(JX+1024)
920 P=FE: F=FE
930 NEXT JX
940 POKE1024+X,FE:POKE1024+L,FE: L=0:PZ=0
950 RETURN
960 IF X<0 THEN X=0
970 IF X+LA>6143 THEN LA=LA-1: GOTO970
980 IF X+LA<0 THEN LA=LA+1: GOTO980
990 IF X>6143 THEN X=6143
1000 IF X<6112 AND X>QM THEN QM=X
1010 RETURN
1020 IF X>6143 THEN X=0
1030 IF X<0 THEN X=6143
1040 IF X<6112 AND X>QM THEN QM=X
1050 RETURN
1060 SX=1
1070 SW=X
1080 GOSUB1940: X=X-1
1090 Y$=INKEY$: IF Y$="" THEN 1090
1100 IF SX=1 THEN SX=0: Y$="": GOTO1090
1110 IF Y$="/" THEN X=X-1:PZ=0:F=PEEK(1024+X): X=SW: RETURN
1120 LY(W)=(INT(RB/384)*24)+24: LE$(W)=Y$
1130 IF X=RB>32 THEN RB=RB+384
1140 LX(W)=((X-RB)*12)+12: W=W+1
1150 FOR S=1 TO 384 STEP 32
1160 JP=ASC(Y$)
1170 IF JP>95 THEN JP=JP-96
1180 IF JP<65 THEN JP=JP+64
1190 POKE1024+X+S,JP: NEXT
1200 X=X+1: GOSUB960
1210 GOTO1090
1220 MK=80: ' PRINTER SEQUENCE
1230 P$=INKEY$: IF P$="" THEN 1230
1240 IF P$="/" THEN GOSUB2570: RETURN
1250 IF P$="P" THEN GOSUB2570: GOTO 1260: ELSE 1230
1260 PRINT#-2,CHR$(18): PRINT#-2,"A": PRINT#-2,CHR$(18): PRINT#-2,"S1"
1270 PRINT#-2,"M2,5": PRINT#-2,"I"
1280 FOR Q=0 TO W-1
```


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```
1290 PRINT#-2,"M";LX(Q);",";-LY(Q)
1300 PRINT#-2,"P";LE$(Q)
1310 NEXT
1320 PRINT#-2,"H"
1330 PRINT#-2,"M-2,-5": PRINT#-2,"I"
1340 FOR QC=0 TO E
1350 IF QC=2 OR QC=7 THEN QD=2
1360 IF QC=3 OR QC=6 THEN QD=1
1370 IF QC=4 OR QC=8 THEN QD=3
1380 IF QC=1 OR QC=5 THEN GOTO1530
1390 IF QC=0 THEN QD=0
1400 PRINT#-2,"C";QD
1410 FOR QG=0 TO QM STEP32
1420 FOR QH=1 TO 2
1430 FOR QF=0 TO 31
1440 QA=PEEK(QF+QG+1024)
1450 IF QA<128 THEN 1500
1460 IF QC>0 AND QC=(QA-127)/16 THEN 1480
1470 IF QC=0 AND ((QA-128)/16)=(INT((QA
-128)/16)) THEN 1480 ELSE 1500
1480 QX=12*QF: QY=((QG*2)/32)+(QH-1)
1490 PRINT#-2,"M";QX;",";-QY: PRINT#-2,
"J12,0"
1500 NEXT QF
1510 NEXT QH
1520 NEXT QG
1530 NEXT QC
1540 PRINT#-2,"A"
1550 RETURN
1560 POKE1024+X,P
1570 IF LA<>0 THEN POKE1024+X+LA,FE
1580 RETURN
1590 F=PEEK(1024+X)
1600 IF LA>0 THEN FE=PEEK(1024+X+LA)
1610 RETURN
1620 IF (L-X)/32=INT((L-X)/32) THEN ST=
32: GOTO1650
1630 IF (L-X)/31=INT((L-X)/31) THEN ST=
31:GOTO1650
1640 IF (L-X)/33=INT((L-X)/33) THEN ST=
33: ELSE ST=1
1650 RETURN
1660 ' TAPE SEQUENCE
1670 G$=INKEY$: IF G$="" THEN 1670
1680 IF G$="/" THEN GOSUB2570: RETURN
1690 IF G$="R" THEN TM=0:GOSUB2570: GOT
O1720
1700 IF G$="S" THEN TM=0: GOSUB2570: GO
TO1750
1710 GOTO1660
1720 CSAVEM "SCREEN",1024,7167,6144
1730 CLOSE#-1
1740 RETURN
1750 CLS8: PMODE4,1: PCLS1
1760 CLOADM "SCREEN",0
1770 RETURN
1780 DX=1: ' SCREEN CLEARING
1790 IF PEEK(338)=254 THEN EH=0:GOSUB26
20: GOTO1910
1800 IF PEEK(342)=251 THEN 1810 ELSE 1820
1810 IF (I-1024)/32 =INT((I-1024)/32) T
HEN 160: ELSE POKEI,CK+127: I=I+1: GOTO
1810
1820 IF PEEK(339)=254 THEN EH=1:GOSUB26
20:GOTO1910
1830 IF PEEK(340)=254 THEN EH=2:GOSUB26
20:GOTO1910
1840 IF PEEK(341)=254 THEN EH=3:GOSUB26
20:GOTO1910
1850 IF PEEK(342)=254 THEN EH=4:GOSUB26
20:GOTO1910
1860 IF PEEK(343)=254 THEN EH=5:GOSUB26
20:GOTO1910
1870 IF PEEK(344)=254 THEN EH=6:GOSUB26
20:GOTO1910
1880 IF PEEK(345)=254 THEN EH=7:GOSUB26
20:GOTO1910
1890 IF PEEK(338)=253 THEN EH=8:GOSUB26
20:GOTO1910
1900 IF PEEK(345)=253 THEN DX=0
1910 CK=EH*16: IF CK=0 THEN CK=1
1920 IF EH>E THEN E=EH
1930 GOTO140
1940 RB=32*INT(X/32)
1950 RA=X-RB
1960 IF RB/384=INT(RB/384) THEN X=RB+RA
: RD=0: RETURN: ELSE 1970
1970 IF RD=1 THEN 2010
1980 IF RB<(X-(RA+192)) THEN 2000
1990 RB=RB-32: IF RB<0 THEN X=RA: RETUR
N: ELSE GOTO1960
2000 RB=X-RA: RD=1
2010 RB=RB+32: IF RB>6112 THEN X=5760+R
A: RD=0: RETURN: ELSE GOTO 1960
2020 'SCREEN SEQUENCE 2
2030 IF PEEK(339)=254 THEN DH=1:GOTO680
2040 IF PEEK(340)=254 THEN DH=2:GOTO680
2050 IF PEEK(341)=254 THEN DH=3:GOTO680
2060 IF PEEK(342)=254 THEN DH=4:GOTO680
2070 IF PEEK(343)=254 THEN DH=5:GOTO680
2080 IF PEEK(344)=254 THEN DH=6:GOTO680
2090 IF PEEK(345)=254 THEN DH=7:GOTO680
2100 IF PEEK(338)=253 THEN GOSUB1560: X
=SK: DH=1: YT=0: GOSUB1590: PZ=PU
2110 IF PEEK(339)=253 THEN DH=12:GOTO680
2120 IF PEEK(339)=239 THEN R=0:GOTO680
2130 IF PEEK(345)=239 THEN R=13:GOTO680
2140 IF PEEK(343)=251 THEN R=5:GOTO680
2150 IF PEEK(340)=239 THEN R=7:GOTO680
2160 IF PEEK(342)=239 THEN R=3:GOTO680
2170 IF PEEK(339)=223 THEN R=11:GOTO680
2180 IF PEEK(343)=239 THEN R=10:GOTO680
2190 IF PEEK(339)=247 THEN R=14:GOTO680
2200 IF PEEK(345)=247 THEN R=12:GOTO680
2210 IF PEEK(338)=239 THEN R=6:GOTO680
2220 IF PEEK(339)=251 THEN R=15:GOTO680
2230 IF PEEK(341)=239 THEN R=2:GOTO680
2240 IF PEEK(342)=251 THEN R=10:GOTO680
2250 IF PEEK(344)=251 THEN R=8:GOTO680
2260 IF PEEK(345)=251 THEN R=12:GOTO680
2270 IF PEEK(338)=247 THEN R=4:GOTO680
2280 IF PEEK(340)=247 THEN R=5:GOTO680
2290 IF PEEK(341)=247 THEN R=1:GOTO680
2300 IF PEEK(342)=247 THEN R=3:GOTO680
2310 IF PEEK(341)=253 THEN R=9:GOTO680
2320 IF PEEK(338)=254 THEN SK=X: GOSUB1
560: X=INT(X/384)*384: GOSUB1590:DH=12:
YT=1: PU=PZ: PZ=1
2330 IF PEEK(338)=253 THEN GOSUB1560: X
=SK: DH=1: YT=0: GOSUB1590: PZ=PU
2340 GOTO500
2350 ' VARIOUS ROUTINES
2360 GOSUB1940
2370 DL=1  2380 DM=X
2390 FOR N=1 TO DH
2400 IF (1024+X)>7168 THEN 2430
2410 POKE1024+X,M+R
2420 X=X+32   2430 NEXTN
2440 IF B=1 THEN X=X-32: RETURN
2450 X=DM     2460 RETURN
2470 IF CK=1 OR C=0 THEN CF=197 ELSE CF
=128
2480 IF CK=64 OR C=4 THEN CG=223 ELSE C
G=191
2490 IF CK=48 OR C=3 THEN CH=159 ELSE C
H=175
2500 RETURN
2510 FOR BL=5759 TO 6143 STEP 32
2520 BM(G)=PEEK(BL)
2530 POKEBL+1024,MK    2540 G=G+1: NEXT
2550 G=0    2560 RETURN
2570 FOR BL=5759 TO 6143 STEP 32
2580 POKEBL+1024,BM(G)
2590 G=G+1: NEXT  2600 G=0
2610 RETURN
2620 I=(INT(I/32))*32   2630 RETURN
2640 DL=0: GOSUB1560: X=X+1:GOSUB2650:
GOSUB1020: GOSUB1590: RETURN
2650 IF X/32=INT(X/32) THEN X=X+384: X=
INT(X/384)*384
10000 FOR JH=1 TO 10000: NEXT
10010 FOR JF=1 TO 2
10020 CLS3: PRINT@0,JF: CSAVE "SG24"
10030 IF JF=4 THEN 10060
10040 CLS4: FOR JE=1 TO 6000: NEXT
10050 NEXT JF
```

Disk Detective

Pam D'Arcy doctor disks to deal with desperate Dragon DOS enquiries

HERE WE ARE, Brian Cadge, Simon Buxton (June Dragon Answers) and other desperate Dragon DOS users — an instant "Disk Doctor" to enable you to inspect and change the contents of a disk. I have called it DISK DETECTIVE rather than DISK DOCTOR as it contains minimal facilities and was actually commenced some time ago (when I would have paid pounds for a Disk Doctor to overcome problems I had with one particular disk at that time!).

The intention had been to develop it to give a decent disk catalogue and "wild card" disk maintenance (as in KILL D*.BAS — kill all files with filetype. BAS whose name commences with letter D) — alas lack of time continues to intervene.

Having only got as far as the "view" facility, I have quickly tagged on the "edit" facility for this article. I won't give you details of file directory layouts etc. as there is now an excellent booklet on Dragon DOS available from Grosvenor Software (see their regularly placed adverts) and I am strongly in favour of supporting those who continue to support us!

As regards the program listing, REM lines were added later for documentation purposes for you — they can be omitted — as can the "PRINTER DUMP" lines if a printer is not available (though I haven't tried the program without these lines!). Press the BREAK key to end the program (or include a, say, "Q" check for Quit in the main INKEY$ facility routine — lines 320+ — if you want it all neatly tied up!).

Good luck!

Program synopsis

The program reads any physical block of 256 bytes that a disk is accessed in (= SECTORS), stores in in memory and displays the data on the screen in "pages" of 64 bytes (page up/down using the up/down arrow keys). An EDIT facility is available which allows bytes of the sector currently in memory to be changed and for the updated sector to be written to the disk.

Options available in both EDIT and VIEW modes are:

- D Dump copy of state of sector currently in memory to the printer
- F Forward — read and display next sector on the disk
- B Backwards — read and display previous sector on the disk

```
10 REM DISK DETECTIVE - PAM D'ARCY - 13 JUNE 1985
20 PMODE0,1:PCLEAR1:CLEAR2000
30 DA=PEEK(&HBA)*256+PEEK(&HBB)
40 D=1:T=20:S=3:DEV=0
50 SPACER$=CHR$(13)+CHR$(10):SPACER$=SPACER$+SPACER$ :REM PRINTER DUMP LINE
60 ERROR GOTO1420
70 M$="view":GOTO120
80 M$="edit":PTR$=CHR$(95):GOTO120
90 GOSUB1010:GOSUB1020:PRINT@128,"ENTER TRACK (0-39),SECTOR (1-18)";:INPUT T,S
100 IF INT(T)<>T OR T<0 OR T>39 THEN90
110 IF INT(S)<>S OR S<1 OR S>18 THEN90
120 GOSUB960
130 SREAD D,T,S,SA$,SB$
140 REM COPY STRINGS SA$,SB$ TO CONTIGUOUS DATA WORK AREA (GRAPHICS PAGE 1)
150 X=0:V=VARPTR(SA$):AA=PEEK(V+2)*256+PEEK(V+3):SA=AA:GOSUB1100
160 V=VARPTR(SB$):AA=PEEK(V+2)*256+PEEK(V+3):SB=AA:GOSUB1100
170 X=0
180 GOSUB1010:Y=DA+X:PRINT@96,X;"(&H";HEX$(X);")"
190 GOSUB1140
200 IFM$="edit"THEN C=0:R=0:PRINT@130,PTR$;
210 IF PTR$=CHR$(127)THEN510
220 K$=INKEY$:IFK$=""THEN220
230 IFK$="F"THEN430
240 IFK$="B"THEN460
250 IFK$="N"THEN90
260 IFK$="D"THEN760: REM PRINTER DUMP LINE
270 IFM$="edit"THEN370
280 REM 'VIEW' ONLY OPTIONS
290 IFK$="E"THEN80
300 IFK$=CHR$(94)THEN340
310 IFK$<>CHR$(10)THEN220
320 X=X+64:IF X>255 THEN X=0
330 GOTO180
340 X=X-64:IF X<0 THEN X=192
350 GOTO180
360 REM 'EDIT' ONLY OPTIONS
370 IFK$="V"THEN70
380 IFK$="S"THEN800
390 IFK$="C"THEN500
400 GOSUB1270
410 IFK$=""THEN220
420 IFK$="<"THEN340 ELSE320
```

N New track and sector number — for getting around the disk fast

Additional VIEW mode options:
up/down arrow keys page the 64 byte display backwards/forwards
E switch to Edit mode

Additional EDIT mode options:
(display is the same as View except that there is a left arrow pointer against the "current" byte)
all the arrow keys move pointer as appropriate
C Change byte — switches to CHANGE MODE — see below
S Save the current state of the sector in memory to disk. Because of the potential disaster that this facility could wreak upon your precious disks, two further prompts require Y answers before writing commences!
V Switch to View mode (reads from the disk so can be used to re-read a sector if you have made a mess of the current in-memory copy when attempting to edit it)

CHANGE MODE operation:
(arrow pointer changes to inverted display)

<enter> key	revert to EDIT mode
all the arrow keys	move pointer as required

0-9 A-F change byte currently pointed to (changes the byte in the current memory copy of sector only at this stage; to copy (= write) the updated sector to disk, exit this mode (<enter> key) and use the S option and so on).

The byte is changed as per calculator type input (you will quickly see what I mean if you try it — it seems difficult to explain but I'll try!).

On receiving a valid hex character, the current right hand hex character of the byte (= least significant nibble) overwrites the current left hand hex character of the byte (= most significant nibble) and the new hex character becomes the new least significant nibble which means that to replace a byte currently containing the ASCII character "5" (hex $35) with "A" (hex $41), I would

	now	35 need	41
press 4	"	35 becomes	54 (letter "T")
press 1	"	54 "	41 (letter "A")

The pointer is only moved on by using the arrow keys so you can have unlimited stabs at getting the correct result if you you are not too familiar with the hex codes (the ASCII display to the right of the 64 byte block is also updated with every key press).

Press the <ENTER> key to revert to the EDIT mode from where the SAVE SECTOR option can be called.

As recommended by Brian, backup the problem disk and mess about with the copy disk only! Having typed in the DISK DETECTIVE PROGRAM, SAVE'd it (with a filename!), LOAD it, put the copy of the problem disk in the drive and RUN disk detective. It automatically commences in VIEW mode at Tract 20, Sector 3 (the start of the filename directory). Anyone having entered SAVE"" will find an entry similar to SECTOR DUMP 1 where I deliberately saved this program without a filename — an entry of BAS preceded by 8 null ($00) bytes. The entry can now be edited to insert a filename.

Switch to Edit mode (press E)
Switch to Change mode (press C)
Move the pointer to the first character of the 8 character filename field (in this example, press right arrow key once).

Enter the filename (one letter is sufficient to "recover" normal DOS services). I pressed 4 then 1 (= "A")

Press <ENTER> to revert to Edit mode

Save the updated sector (press S & Y in response to prompts) and Bob's your uncle — normal DOS service is resumed!

Break out of the program and RENAME or whatever as you wish.

Have fun looking at your disks even if you are fortunately not in need of the EDIT facility . . . yet.

```
430 IF S=18 AND T=39 THEN S=1:T=0:GOTO120
440 S=S+1:IFS>18THENS=1:T=T+1
450 GOTO120
460 IFS=1 AND T=0 THEN S=18:T=39:GOTO120
470 S=S-1:IFS<1THENS=18:T=T-1
480 GOTO120
490 REM CHANGE BYTE
500 PTR$=CHR$(127):PRINT@127+(C*3)+3+(R*32),PTR$;:GOSUB1070
510 K$=INKEY$:IFK$=""THEN510
520 IFK$=CHR$(13)THENGOSUB1050:PTR$=CHR$(95):PRINT@130+(C*3)+(R*32),PTR$;:GOTO22
0
530 REM CHECK FOR 0-9,A-F FIRST
540 A=ASC(K$)-48
550 IF A<0 THEN600
560 IF A<10 THEN640
570 A=A-7
580 IF A>9 AND A<16 THEN640
590 REM NOT HEX SO CHECK FOR ARROW KEYS
600 GOSUB1270
610 IFK$=""THEN510 ELSE420
620 REM CHANGE BYTE IN WORK AREA+DISPLAY
630 REM MOVE RIGHT HAND SIDE OF BYTE TO LEFT & PUT HEX VALUE ENTERED IN RIGHT HA
LF (NIBBLE)
640 B=PEEK(DA+X+((C+1)+(R*8))-1)
650 REM SAVE RIGHT HAND NIBBLE&MAKE IT THE NEW LEFT HAND NIBBLE (=ITS CURRENT VA
LUE*16)
660 B=(B AND 15)*16
670 REM STORE UPDATED BYTE VALUE IN WORK AREA
680 POKE(DA+X+((C+1)+(R*8))-1),B+A
690 REM UPDATE SCREEN DISPLAY
700 POKE1152+(C*3)+(R*32),PEEK(1153+(C*3)+(R*32))
710 PRINT@129+(C*3)+(R*32),K$;
720 IF A+B<32 THEN K$="." ELSE K$=CHR$(B+A)
730 PRINT@152+C+(R*32),K$;
740 GOTO510
750 REM PRINTER DUMP ROUTINE (3 LINES)
760 GOSUB1020:PRINT@448," dumping to printer in progress"
770 DEV=2:GOSUB980:OX=X:FOR X=0 TO 255 STEP 64:GOSUB1140:NEXTX:PRINT#-DEV,SPACER
$:X=OX
```

```
780 DEV=0:GOSUB1040:GOTO220
790 REM SAVE SECTOR ROUTINE
800 GOSUB1020:PRINT@451,"write this sector to disk":PRINT@484,"ARE YOU SURE? (Y
if so)";
810 K$=INKEY$:IFK$=""THEN810
820 IFK$<>"Y"THEN950
830 PRINT@481,"CORRECT DISK IN THE DRIVE?(Y)";
840 K$=INKEY$:IFK$=""THEN840
850 IFK$<>"Y"THEN950
860 GOSUB1020:PRINT@451,"saving to disk in progress"
870 REM COPY UPDATED WORK AREA BACK INTO DTRINGS SA$,SB$ FOR SWRITE
880 FOR XX=0 TO 127
890 POKE(SA+XX),PEEK(DA+XX)
900 NEXTXX
910 FOR XX=0 TO 127
920 POKE(SB+XX),PEEK(DA+128+XX)
930 NEXTXX
940 SWRITE D,T,S,SA$,SB$
950 GOSUB1050:GOTO300
960 GOSUB970:GOSUB990:GOSUB1030:RETURN
970 CLS:PRINT@9,"disk detective":PRINT@28,M$;:RETURN
980 PRINT#-DEV,SPACER$:PRINT#-DEV,M$ :REM PRINTER DUMP LINE
990 PRINT#-DEV,"DRIVE";D;"  TRACK";T;"  SECTOR";S:RETURN
1000 PRINT@P,STRING$(32,"=");:RETURN
1010 PRINT@96,"":FORP=1 TO 8:PRINT:NEXTP:RETURN
1020 PRINT@448,"":PRINTSTRING$(31," ");:RETURN
1030 P=64:GOSUB1000:P=416:GOSUB1000
1040 IF M$="view" THEN GOSUB1020:PRINT@448,"up/down arrows; Forward; Back;  Dump
 to printer; New addr; Edit";
1050 IF M$="edit" THEN GOSUB1020:PRINT@448,"arrow keys=pointer; Change byte;Save
 new sector; View; F,B,N,D";
1060 RETURN
1070 GOSUB1020:PRINT@448,"in Change byte mode; ENTER KEY  to exit mode;arrow key
s=pointer";
1080 RETURN
1090 REM COPY 128 BYTES FROM SREAD STRING TO WORK AREA
1100 XX=0:FORX=X TO X+127
1110 POKE(DA+X),PEEK(AA+XX)
1120 XX=XX+1:NEXTX:RETURN
1130 REM DISPLAY/PRINT BLOCK 8*8 CHARS IN HEX&ASCII
1140 FOR XX=X TO X+63 STEP 8
1150 Y=DA+XX:FOR P=1 TO 8
1160 V=PEEK(Y):IF V<16 THEN PRINT#-DEV,"0";
1170 PRINT#-DEV,HEX$(V);" ";
1180 Y=Y+1:NEXTP
1190 Y=DA+XX:FOR P=1 TO 8
1200 V=PEEK(Y)
1210 IF V<32 THEN PRINT#-DEV,".";:GOTO1240
1220 IF DEV=2 AND V>127 THEN V=V-128:GOTO1210
1230 PRINT#-DEV,CHR$(V);
1240 Y=Y+1:NEXTP:IF DEV=2 THEN PRINT#-DEV,""
1250 NEXT XX:RETURN
1260 REM EDIT MODE - CHECK FOR ARROW KEY PRESSED&MOVE POINTER OR SET K$ TO PAGE
FORWARD/BACK
1270 A=ASC(K$)-7:K$=""
1280 IF A<0 OR A>87 THEN1410
1290 IF A<4 THEN1320
1300 IF A=87 THEN A=4 ELSE1410
1310 A=4
1320 PRINT@130+(C*3)+(R*32)," ";
1330 ON A GOTO1340,1360,1390,1380
1340 IF C=0 THEN C=7 ELSE C=C-1
1350 GOTO1400
1360 IF C=7 THEN C=0 ELSE C=C+1
1370 GOTO1400
1380 IF R=0 THEN K$="<":GOTO1410 ELSE R=R-1:GOTO1400
1390 IF R=7 THEN K$=">":GOTO1410 ELSE R=R+1
1400 PRINT@130+(C*3)+(R*32),PTR$;
1410 RETURN
1420 PRINTERR,ERL:STOP
```

Zooming in on the screen

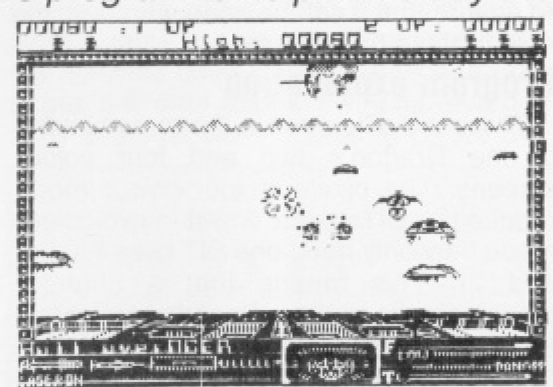
***Peter Whittaker** developed this program to help him study the art of graphic character design.*

IT SEEMS that whenever I try to draw graphic characters for a game on my Dragon, the result falls short of the results acheived by some games-writers. Although I have not been able to improve my own artistic ability, I have written this program, *ZOOM* to enable me to study the characters designed by other programers.

The BASIC program controls a machine-code routine which will enlarge a quarter section of the screen to full screen size (see screen dumps). The process can be repeated endlessly, but after several enlargements the original pixels will have enlarged to a size greater than that taken up by the whole graphics screen.

Program alterations

When RUN, the program will display its MENU screen. This lists all the options available, and can be recalled at any time

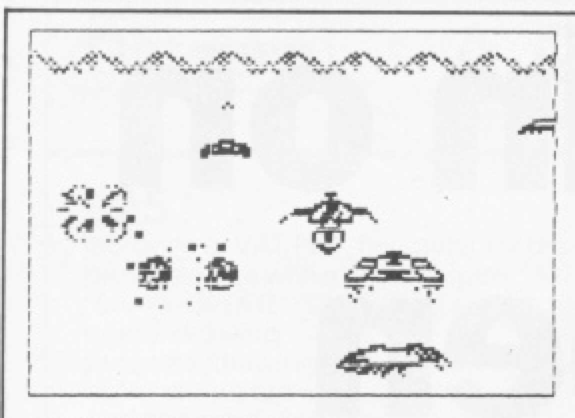


SCREEN DUMP #1.

by pressing the <M> key. When displaying the Menu screen, the program will wait for a key press before continuing on to display the graphics screen. The program as listed is set up to load and save graphics screens to and from disk (Press <N> to load, and <D> to save), but this can be easily altered to load from tape (TAPE PATCH), or to draw a picture instead (for example, change Line 230 PCLS:FOR A=1 TO 10:CIRCLE (RND (255), RND (191)), RND (15)*1;,1,RND(0):NEXT A)

The program will then place a 'Quarter-Screen' box over the picture. This is the target for *ZOOM*. The box can be moved around the screen by pressing any of the arrow keys. The vertical arrows will move the box one pixel up or down. If these are pressed with the shift key, then the box will move up or down ten pixels. Pressing the left or right arrows will move the box eight pixels to the side. The program will not let the box move over the edge of the screen, but will keep it within the screen boundary. When the box is targeted over the area to be examined, press the <ENTER> key, and the screen will zoom in on that area. Once the screen has been enlarged, it can

```
'ZOOM' ON THE 32.
10 PMODE3,1:PCLS:SCREEN1,0:SC=1
20 A$="BM110,91;BL14BU4;C2;R5M-5,7;
   R5BR4H2U3E2R2F2D3G2L2BR6H2U3E2R
   2F2D3G2L2BR6U5E2R2F2ND5E2R2F2D5
   "
30 FOR A=1 TO 30:DRAW"S"+STR$(A)+A$
   :NEXT
40 PCLEAR8:CLEAR200,25000:CU=9216
45 MODE=0
50 '******SCREEN BACKUP*********
60 DATA 142,12,0,16,142,100,200,236
   ,129,237,161,140,36,0,37,247,57
   ,142,12,0,16,142,100,200,236,16
   1,237,129,140,36,0,37,247,57
70 FOR A=1 TO 34:READ B:POKE25000+A
   ,B:NEXT
75 '******MENU SCREEN*********
80 CLS:PRINT@10,CHR$(133);"ZOOM MEN
   U";CHR$(138):PRINT@42,STRING$(1
   1,131):PRINT:PRINT"M...RETURN T
   O OPTIONS LIST       N...LOAD NE
   W SCREEN FROM DISC.  D...DUMP S
   CREEN TO DISC          S...SAVE
   SCREEN TO HI-MEMORY.    R...REST
   ORE HI-MEMORY SCREEN.
90 PRINT"1/2...SELECT COLOUR SET.":
   PRINT"3/4...COLOUR OR MONOCHROM
   E."
100 PRINT"<ARROWS>...MOVE TARGET BO
   X.    <ENTER>....ZOOM IN ON TA
   RGET."
110 PRINT@425,"ANY       KEY":A=397:P
   RINT@A,CHR$(129);CHR$(131);CHR$
   (130);:PRINT@A+34,CHR$(138);:PR
   INT@A+64,CHR$(132);CHR$(140);CH
   R$(136);:PRINT@A+32,CHR$(133);:
   EXEC41194
120 SCREEN1,SC:IF MODE=0 THEN 460
130 '****** BACK UP SCREEN******
140 FOR A=1 TO 4:PCOPY A TO A+4:NEX
   T
150 GOTO330
160 '**********KEEY SCAN**********
170 A$=INKEY$:IF A$=""THEN 170
180 IF A$="3" THEN 460
190 IF A$="4" THEN 530
200 IF A$="1" THEN SCREEN1,0:SC=0:G
   OTO170
210 IF A$="2" THEN SCREEN1,1:SC=1:G
   OTO170
220 IF A$="M"THEN 80
230 IF A$="N"THEN CLS:PRINT@43,"LOA
   D SCREEN":PRINT@355,"";:INPUT"F
   ILENAME";A$:LOADA$+".BIN":GOTO1
   20
235 '*******CURSOR ROUTINE*******
240 IF A$=CHR$(8) THEN IF X>0 THEN
   CU=CU-1:GOTO330
250 IF A$=CHR$(9) THEN IF X<128 THE
   N CU=CU+1:GOTO330
260 IF A$=CHR$(94) THEN IF Y>0 THEN
   CU=CU-32:GOTO330
270 IF A$=CHR$(10) THEN IF Y<95 THE
   N CU=CU+32:GOTO 330
280 IF A$=CHR$(95) THEN IF Y>9 THEN
```



SCREEN DUMP #2. ZOOM*1

be enlarged again and again simply by targeting the box, and pressing the <ENTER>.

If you are loading your pictures from tape, then it would be a slow process to load the screen each time you wanted to examine it. To overcome this I have included a screen backup routine. Pressing <S> will save the current screen to high memory, and pressing the <R> will restore it to the screen.

The number keys from <1> to <4> control the screen colour set, and the colour mode. Pressing <1> selects SCREEN1,0 whilst the <2> selects SCREEN1,1. Pressing <3> selects PMODE3,1 and <4> will select PMODE4,1. There will be a short delay when changing from PMODE3 to 4 and vice versa, whilst the computer changes the machine-code used by the zoom program (see below). Pressing any other key will change the colour of the targeting box, to ensure that it can be seen whatever the colour of the background.

Program explanation

There is a difference in the screen layout of the Dragon's two and four colour screens. The pixels in four colour mode require two BITs each, whilst in two colour mode they only need one BIT (See FIGS 1 and 2). This means that a different machine-code routine is needed for zooming in on colour screens (ASSEMBLER 'ZOOM PMODE3,1'). However, in both cases we need to expand the contents of one BYTE to fill four. As it is the easiest to explain, I will deal with the two colour mode zoom first. (ASSEMBLER 'ZOOM PNMODE4,1')

A BYTE is loaded into the 'A' register, and then manipulated into the 'B' register (FIG 3). Fig 4 shows the effects of the different machine-code instructions used.

Step 1. load the 'A' register with the BYTE.

Step 2. LSRA. This moves every BIT in the 'A' register one place to the right. The rightmost BIT is moved into the 'Carry' BIT of the 'Condition Code' register.

Step 3. RORB This moves all the BITs in the 'B' register one place right, and then moves the Carry BIT out of the Condition Code register, and into the leftmost BIT of the 'B' register.

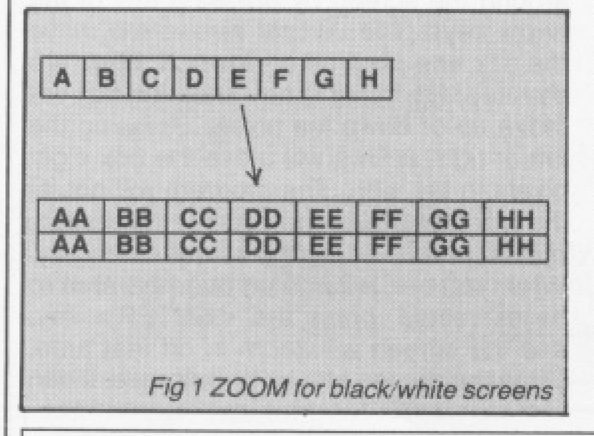
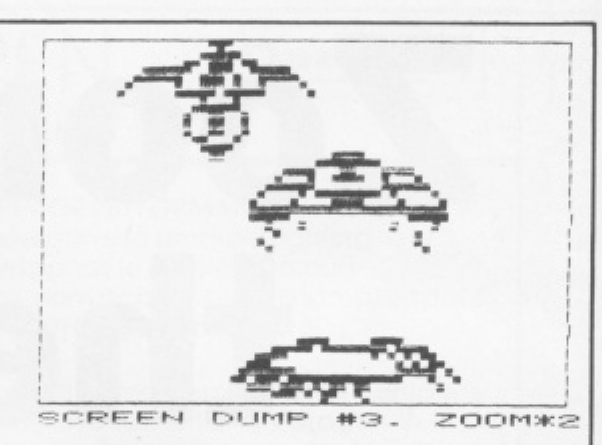


Fig 1 ZOOM for black/white screens



SCREEN DUMP #3. ZOOM*2

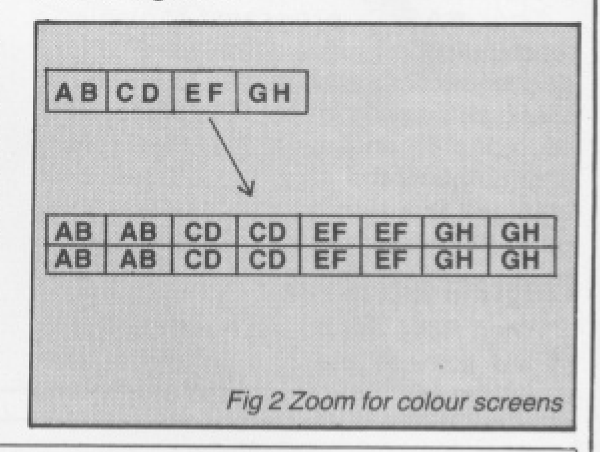


Fig 2 Zoom for colour screens

```
    CU=CU-320:GOTO 330
290 IF A$=CHR$(91) THEN IF Y<86 THE
    N CU=CU+320:GOTO330
295 '*******ZOOM ROUTINE**********
300 IF A$<>CHR$(13) THEN 380
310 A=INT(CU/256):B=CU-(256*A)
320 POKE32002,A:POKE32003,B:EXEC320
    01:GOTO140
330 FOR A=1 TO 4:PCOPY A+4 TO A:NEX
    T
340 A=CU-9216:X=0:Y=0
350 IF X+31<A THEN A=A-32:Y=Y+1:GOT
    O350 ELSE X=A*8
360 LINE(X,Y)-(X+127,Y+95),PSET,B
370 GOTO170
375 '******HI-MEMORY SCREEN******
380 IF A$="S" THEN SOUND100,1:FOR A
    =1 TO 4:PCOPY A+4 TO A:NEXTA:EX
    EC 25001:GOTO 140
390 IF A$="R" THEN SOUND100,1:EXEC2
    5018:GOTO 140
400 IF A$="D" THEN FOR A=1 TO 4:PCO
    PY A+4 TO A:NEXT:CLS:PRINT@42,"
    SAVE SCREEN":PRINT@355,"";:INPU
    T"FILENAME";A$:SAVEA$,3072,9216
    ,0:GOTO120
410 '*******BOX COLOUR********
420 Z=Z+1:IF Z=5 THEN Z=1
430 COLOR Z:LINE(X,Y)-(X+127,Y+95),
    PSET,B:SOUND100,1
440 GOTO 170
450 '*******COLOR ZOOM**********
```

```
460 DATA 8E,24,0,10,8E,C,0,86,10,B7
    ,7D,46,A6,80,B7,7D,47,8D,1E,E7,
    A8,21,E7,21,8D,17,E7,A8,20,E7,A
    1,7A,7D,46,26,E8,31,A8,20,30,88
    ,10,10,8C,24,0,25,D7,39,8D,3,8D
    ,1,39,47,56,47,56,B6,7D,47,47,5
    6,47,56,B7,7D,47,39
470 RESTORE:FOR A=1 TO 34:READ B$:N
    EXT
480 FOR A=32001 TO 32069:READ B$:PO
    KEA,VAL("&H"+B$):NEXT A
490 PMODE3,1:MODE=3
500 FOR A=1 TO 4:PCOPY A+4 TO A:NEX
    T A
510 GOTO120
520 '******B/W ZOOM************
530 DATA 8E,24,0,10,8E,C,0,86,10,B7
    ,7D,3D,A6,80,8D,1E,E7,A8,21,E7,
    21,8D,17,E7,A8,20,E7,A1,7A,7D,3
    D,26,EB,31,A8,20,30,88,10,10,8C
    ,24,0,25,DA,39,C6,4,F7,7D,3E,44
    ,56,57,7A,7D,3E,26,F8,39
540 RESTORE:FOR A=1 TO 103:READ B$:
    NEXT
550 FOR A=&H7D01 TO &H7D3C:READ B$:
    POKEA,VAL("&H"+B$):NEXT A
560 PMODE4,1:MODE=4
570 FOR A=1 TO 4:PCOPY A+4 TO A:NEX
    T A
580 GOTO120
590 '(C)1985 BY PETER WHITTAKER
```

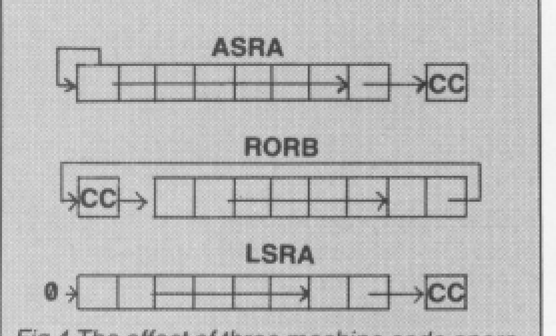


Fig 4 The effect of three machine code operations

Step 4. ASRB This duplicates the leftmost BIT in the 'B' register, by moving all the BITs one place to the right. However, unlike the previous step, the leftmost bit is left unchanged.
Step 5. The steps 2-4 are repeated until the 'B' register has been filled. This will have used half of the contents of the 'A' register (EFGH).
Step 6. The 'B' register is transfered to the screen, twice, and then the process is repeated from Step 2, to enlarge the other half of the original BYTE. This process is continued until the screen is filled, and the picture is fully enlarged.

Let us now move on to the code for the colour version of zoom (Assembler #2).
Step 1. Load the 'A' register with the BYTE, and store it at @TEMP.
Step 2. ASRA:RORB move the right most bit from the 'A' register into the left most bit of the 'B'.
Step 3. ASRA:RORB move the next BIT across.
Step 4. LDA @TEMP restore the 'A' register to as it was before step 2.
Step 5. ASRA:RORB:ASRA:RORB move the same two bits across from 'A' to 'B' as in steps 2&3. (for example 10 in 'A' is now 1010 in 'B')
Step 6. STA @TEMP store the modified 'A' register.
Step 7. Repeat steps 2-6 to fill the 'B' register.
Step 8. Store the BYTE twice on the screen. (at Y and at Y+32.)
Step 9. Repeat steps 2-7 to double the second half of the 'A' register into 'B'.
Step 10. Repeat steps 1-9 until the screen is full.

The program uses the first four graphics pages for its display, and the next four to store a duplicate screen. When zooming, the machine code copies the picture from pages 5-8 onto pages 1-4. The enlarged copy is immediately copied to pages 5-8.

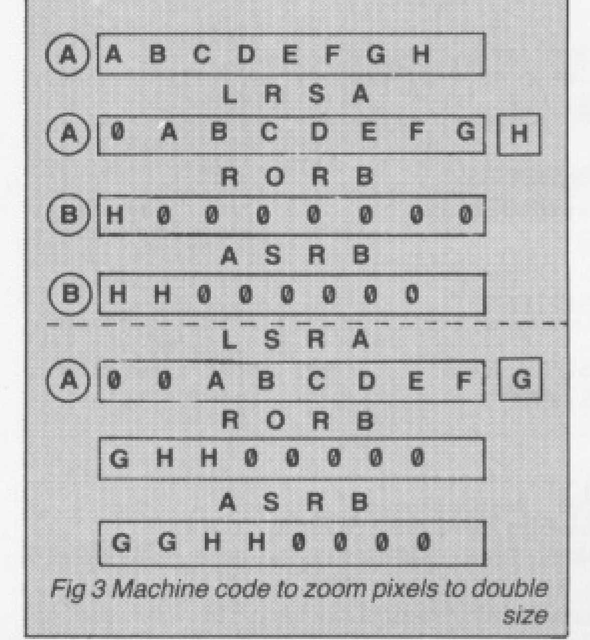


Fig 3 Machine code to zoom pixels to double size

```
ZOOM TAPE PATCH.
40 PCLEAR8:CLEAR200,25000:CU=7680
60 DATA 142,6,0,16,142,100,200,236,
   129,237,161,140,30,0,37,247,57,
   142,6,0,16,142,100,200,236,161,
   237,129,140,30,0,37,247,57
80 CLS:PRINT@10,CHR$(133);"ZOOM MEN
   U";CHR$(138):PRINT@42,STRING$(1
   1,131):PRINT:PRINT"M...RETURN T
   O OPTIONS LIST      N...LOAD NE
   W SCREEN FROM TAPE.  D...DUMP S
   CREEN TO TAPE          S...SAVE
   SCREEN TO HI-MEMORY.   R...REST
   ORE HI-MEMORY SCREEN.
230 IF A$="N"THEN CLS:MOTORON:AUDIO
   ON:PRINT@43,"LOAD SCREEN":PRINT
   @355,"";:INPUT"FILENAME";A$:SCR
   EEN1,SC:CLOADMA$:GOTO120
340 A=CU-7680:X=0:Y=0
400 IF A$="D" THEN FOR A=1 TO 4:PCO
   PY A+4 TO A:NEXT:CLS:PRINT@42,"
   SAVE SCREEN":MOTORON:PRINT@355,
   "";:INPUT"FILENAME";A$:CSAVEMA$
   ,1536,7680,0:GOTO120
460 DATA 8E,1E,0,10,8E,6,0,86,10,B7
   ,7D,46,A6,80,B7,7D,47,8D,1E,E7,
   A8,21,E7,21,8D,17,E7,A8,20,E7,A
   1,7A,7D,46,26,E8,31,A8,20,30,88
   ,10,10,8C,1E,0,25,D7,39,8D,3,8D
   ,1,39,47,56,47,56,B6,7D,47,47,5
   6,47,56,B7,7D,47,39
530 DATA 8E,1E,0,10,8E,6,0,86,10,B7
   ,7D,3D,A6,80,8D,1E,E7,A8,21,E7,
   21,8D,17,E7,A8,20,E7,A1,7A,7D,3
   D,26,EB,31,A8,20,30,88,10,10,8C
   ,1E,0,25,DA,39,C6,4,F7,7D,3E,44
   ,56,57,7A,7D,3E,26,F8,39
```

The saved screen (<S>/<R>) is stored in high memory starting at 25800.

ZOOM is listed for the Dragon with disk drives attached. Because the disk drive relocates the graphics screens 1536 BYTEs higher in memory, there are several alterations which need to be made if the program is to be run without disks. Enter the *ZOOM* listing, and save it to tape. Then make the alterations laid out in the 'ZOOM TAPE PATCH' listing. Now save this as the working version of *ZOOM* for use without discs.

```
'ZOOM' PMODE3,1.

7D01                 90        PRT
7D01 8E2400          20 @START  LDX  #9216
7D04 108E0C00        20         LDY  #3072
7D08 8610            30 @LOOP1  LDA  #16
7D0A B77D46          30         STA  @LINE
7D0D A680            40 @LOOP2  LDA  ,X+
7D0F B77D47          40         STA  @TEMP
7D12 8D1E            40         BSR  @BYTE
7D14 E7A821          40         STB  33,Y
7D17 E721            40         STB  1,Y
7D19 8D17            40         BSR  @BYTE
7D1B E7A820          40         STB  32,Y
7D1E E7A1            40         STB  ,Y++
7D20 7A7D46          50         DEC  @LINE
7D23 26E8            50         BNE  @LOOP2
7D25 31A820          50         LEAY  32,Y
7D28 308810          50         LEAX  16,X
7D2B 108C2400        50         CMPY  #9216
7D2F 25D7            50         BLO  @LOOP1
7D31 39              50         RTS
7D32 8D03            60 @BYTE   BSR  @NIBLE
7D34 8D01            60         BSR  @NIBLE
7D36 39              60         RTS
7D37 47              70 @NIBLE  ASRA
7D38 56              70         RORB
7D39 47              70         ASRA
7D3A 56              70         RORB
7D3B B67D47          70         LDA  @TEMP
7D3E 47              70         ASRA
7D3F 56              70         RORB
7D40 47              70         ASRA
7D41 56              70         RORB
7D42 B77D47          70         STA  @TEMP
7D45 39              70         RTS
7D46 00              80 @LINE   FCC  0
7D47 00              80 @TEMP   FCC  0
7D48                 90         END  @START
```

```
'ZOOM' PMODE4,1.

7D01                 90        PRT
7D01 8E2400          20 @START  LDX  #9216
7D04 108E0C00        20         LDY  #3072
7D08 8610            30 @LOOP1  LDA  #16
7D0A B77D3D          30         STA  @LINE
7D0D A680            40 @LOOP2  LDA  ,X+
7D0F 8D1E            40         BSR  @NIBLE
7D11 E7A821          40         STB  33,Y
7D14 E721            40         STB  1,Y
7D16 8D17            40         BSR  @NIBLE
7D18 E7A820          40         STB  32,Y
7D1B E7A1            40         STB  ,Y++
7D1D 7A7D3D          40         DEC  @LINE
7D20 26EB            40         BNE  @LOOP2
7D22 31A820          50         LEAY  32,Y
7D25 308810          50         LEAX  16,X
7D28 108C2400        50         CMPY  #9216
7D2C 25DA            50         BLO  @LOOP1
7D2E 39              50         RTS
7D2F C604            60 @NIBLE  LDB  #4
7D31 F77D3E          60         STB  @COUNT
7D34 44              70 @LOOP3  LSRA
7D35 56              70         RORB
7D36 57              70         ASRB
7D37 7A7D3E          70         DEC  @COUNT
7D3A 26F8            70         BNE  @LOOP3
7D3C 39              70         RTS
7D3D 00              80 @LINE   FCC  0
7D3E 00              80 @COUNT  FCC  0
7D3F                 90         END  @START
```

Reverse

From David Griffin in South Yorkshire

THE IDEA of the game is to rearrange a string of nine numbers, which are initially shuffled, into their correct sequence 1-9.

The object is to do this in as few moves as possible. Instructions are contained within the program.

Program notes

40-80	Instructions
100-250	Initialise variables.
260-290	Initialise screen.
305-410	Main loop.
420-500	End routine.
1000-1060	Subroutine for printing a number on the hi-res screen.
1500-1570	Subroutine to shuffle numbers.
1800-1840	Subroutine to print move count.
2000-2060	Subroutine to reverse string specified by the player.
2500-2580	Prints instructions.

```
10 '****************************
20 '* REVERSE BY D.B.GRIFFIN. *
30 '****************************
40 CLS:INPUT"DO YOU REQUIRE INSTRUCTIONS";R$
50 R$=LEFT$(R$,1)
60 IF R$="N" THEN 100
70 IF R$<>"Y" THEN 40
80 GOSUB 2500
100 'GRAPHICS FOR NUMBERS 0-9
110 N$(0)="NR16D32R16U32;BR8"
120 N$(1)="BR6;ND32;BR8"
130 N$(2)="R16D16L16D16R16;BR8BU32"
140 N$(3)="R16D16NL16D16NL16;BR8BU32"
150 N$(4)="D16R16ND16U16;BR8"
160 N$(5)="NR16D16R16D16NL16;BR8BU32"
170 N$(6)="D32R16U16NL16;BR8BU16"
180 N$(7)="R16ND32;BR8"
190 N$(8)="NR16D16NR16D16R16U32;BR8"
200 N$(9)="NR16D16R16ND16U16;BR8"
250 NS$="123456789":M=0
260 'INITIALISE SCREEN
270 PMODE1,1:PCLS5:SCREEN1,1
280 GOSUB1500:DRAW"BM30,42C6S4":X$=NS$:GOSUB 1000
290 DRAW"BM94,130C8;ND8F4E4ND8;BR4;D8R8U8NL8;BR4;D4F4E4U4;BR4;NR8D4NR8D4R8;BR4;R
8U4L8U4R8":GOSUB1800
305  START GAME
309 SOUND 80,1
310 I$=INKEY$:IFI$=""THEN310
320 IF INSTR(1,"123456789",I$)=0 THEN 310
330 C=VAL(I$):GOSUB2000
360 COLOR5:LINE(30,42)-(246,74),PSET,BF
370 DRAW"BM30,42C6S4":X$=NS$:GOSUB1000
380 M=M+1:GOSUB1800
390 IF NS$<>"123456789"THEN309
400 SOUND100,2:SOUND140,2:SOUND200,2
410 FORW=1TO2000:NEXTW
420 'END ROUTINE
430 SCREEN0,0:CLS
440 PRINT"YOU DID IT IN";M;"MOVES"
450 PRINT
460 PRINT"ANOTHER GAME (Y OR N)?"
470 I$=INKEY$:IFI$=""THEN470
480 IFI$="Y"THEN250
490 IFI$="N"THEN CLS:END
500 GOTO 470
999 GOTO 999
1000 'PRINT NUMBER STRING
1020 FOR P=1 TO LEN(X$)
1030 E=VAL(MID$(X$,P,1))
1040 DRAW N$(E)
1050 NEXT P
1060 RETURN
1500 'SHUFFLE NUMBER STRING
1510 FOR X=1 TO 15
1520 P1=RND(9)
1530 P2=RND(9)
1540 TEMP$=MID$(NS$,P2,1)
1550 MID$(NS$,P2,1)=MID$(NS$,P1,1)
1560 MID$(NS$,P1,1)=TEMP$
1570 NEXT X:RETURN
1800 'PRINT MOVES
1805 COLOR5:LINE(94,154)-(255,170),PSET,BF
1810 X$=MID$(STR$(M),2)
1820 DRAW"BM94,154C8S2"
1830 GOSUB 1000
1840 RETURN
2000 'REVERSE N NUMBERS
2010 R$=""
2020 FQR X=C TO 1 STEP -1
2030 R$=R$+MID$(NS$,X,1)
2040 NEXT X
2050 NS$=R$+MID$(NS$,C+1)
2060 RETURN
2500 'INSTRUCTIONS
2510 CLS:PRINTTAB(10)"REVERSE"
2520 PRINT
2530 PRINT"THE GAME CONSISTS OF A STRING OFNINE NUMBERS WHICH ARE INITIALLYSHUFF
LED."
2540 PRINT"THE OBJECT IS TO RE-SHUFFLE THEMUNTIL THEY NUMBER 1-9."
2550 PRINT"TO PLAY YOU MUST TYPE IN THE    LENGTH OF THE STRING YOU WANT TOREVER
SE."
2560 PRINT"THIS STRING ALWAYS STARTS FROM  THE LEFTMOST NUMBER."
2570 PRINT:PRINT"PRESS ANY KEY TO BEGIN"
2580 IF INKEY$=""THEN 2580 ELSE RETURN
```

Disk explorations

***Peter Whittaker** provides two disk utilities*

UNLIKE CASSETTES, disks do not provide a great deal of space on their covers for listing what is on them. They are, however, very fast. The two programs which are here presented make full use of that advantage.

The first program is a "Disk-Explorer". This allows any disk to be explored and listed to the screen sector by sector, track by track. The sectors can either be printed as strings, or listed as a sequence of ASCII codes. This program can be used for exploring how the Dragon stores programs on disks.

The second program, "Disk Master Files" is for keeping a list of all your programs from all your disks on one master disk.

The program works by reading the directory track on each disk and storing it as a file on the master disk. There is enough room on one master disk to keep track of the programs on a hundred or more other disks, so it can prove very useful indeed.

Program #1. Explanation.

The Dragon DOS has 40 tracks of 18 sectors each. Tracks 20 and 16 are reserved for the directory and directory backup. Each sector can be read by SREAD1,TRACK,SECTOR,X$,Y$. The strings X$, and Y$ are both 128 characters long.

When RUN the program displays a menu of all functions, and asks for an initial start TRACK and SECTOR number. Subsequent scrolling through the disk is achieved by pressing the left or right arrow keys to move through the sectors, and the up or down arrows to change tracks. Pressing the ?key at any time will list X$ and Y$ as their ASCII codes. Pressing "M" will return to the menu.

Program #2. Explanation.

The directory track is read by SREAD1,20,A,X$,Y$ where A is the sector number.

The strings X$ and Y$ are divided into substrings of 25 characters, each of which is used to refer to one program stored on the disk.

The first character of the substring gives the status of the program. 0 is for an ordinary file, 2 is for a protected file, 129 is for a killed file (which will nor show up on a normal directory listing) and 137 is for the end of files marker. These codes apply regardless of the file type.

The next eight characters contain the file name. If the name is less than eight letters the extra space is filled with zeros.

LISTING #1. DISC EXPLORER.

```
10 CLEAR1000
20 CLS:PRINT@6,"DRAGON DISC EXPLORER":PRINT:PRINT"M.....RETURN TO MENU":PRINT"UP
^...INCREASE TRACK NUMBER":PRINT"DN^...DECREASE TRACK NUMBER":PRINT"RT^...INCREA
SE SECTOR NUMBER":PRINT"LF^...DECREASE SECTOR NUMBER":PRINT"?.....PRINT X/Y$ AS
ASCII"
30 PRINT:INPUT"ENTER TRACK,SECTOR NUMBERS";TRACK,SECTOR
40 IF TRACK<0 OR TRACK>39 OR SECTOR<1 OR SECTOR>18 THEN SOUND50,4:SOUND1;2:RUN
50 CLS:GOTO150
60 '*****MAIN CONTROL LOOP******
70 A$=INKEY$:IF A$=""THEN 70
80 CLS
90 IF A$="M" THEN 20
100 IF A$="^" THEN TRACK =TRACK+1:IF TRACK>39 THEN TRACK=0
110 IF A$=CHR$(10) THEN TRACK=TRACK-1:IF TRACK<0 THEN TRACK=39
120 IF A$=CHR$(9) THEN SECTOR=SECTOR+1:IF SECTOR>18 THEN SECTOR=1
130 IF A$=CHR$(8) THEN SECTOR=SECTOR-1:IF SECTOR<1 THEN SECTOR=18
140 IF A$="?"THEN 180
150 SREAD1,TRACK,SECTOR,X$,Y$
160 CLS:PRINT"TRACK ";TRACK,"SECTOR ";SECTOR:PRINT"X$:-":PRINTX$:PRINT:PRINT"Y$:
-":PRINTY$
170 GOTO70
180 PRINT"X$:-":FOR A=1 TO LEN(X$):PRINTMID$(X$,A,1);"(";ASC(MID$(X$,A,1));")  "
;:NEXTA:PRINT:PRINT"Y$:-":FOR A=1 TO 128:PRINTMID$(Y$,A,1);"(";ASC(MID$(Y$,A,1))
;")  ";:NEXT:PRINT
190 PRINT:PRINT" <ENTER> TO CONTINUE":PRINT" <?> TO REPEAT"
200 A$=INKEY$:IF A$="" THEN 200
210 IF A$="?" THEN 180
220 IF A$=CHR$(13) THEN 150 ELSE 200
230 '(C) 1985 PETER WHITTAKER
```

LISTING #2. MASTER DISC FILES.

```
1 CLEAR5000
2 DIM ARRAY$(50),TYP$(50)
3 ERROR GOTO 10000
10 CLS:PRINT@8,"DISC DIRECTORY":PRINT:PRINT"1...PRINT DISC DIRECTORY":PRINT"2...
SAVE DIRECTORY TO MASTER":PRINT"3...SEARCH MASTER FOR PROGRAM":PRINT"4...DIRECTO
RY OF SAVED DISC":PRINT"5...KILL SAVED DIRECTORY"
20 ON VAL(INKEY$)+1 GOTO 20,2000,3000,40000,5000,6000
21 GOTO20
2000 CLS:B=-1:PRINT"<S> FOR SCREEN <P> FOR PRINTER"
2010 A$=INKEY$:IF A$="S" THEN DN=0 ELSE IF A$="P" THEN DN=-2 ELSE IF A$=CHR$(13)
 THEN DN=0 ELSE 2010
2020 PRINT#DN
2030 IF DN=-2 THEN INPUT"DISC TITLE";A$:PRINT#-2,CHR$(14);"DISC # ";A$;CHR$(15);
CHR$(13);STRING$(80,"-") ELSE PRINTTAB(7)"DISC DIRECTORY"
2040 FOR A=3 TO 18
2050 SREAD1,20,A;X$,Y$
2060 IF LEN(X$)<25 AND Y$<>"" THEN X$=X$+Y$:Y$="" ELSE IF LEN(X$)<25 THEN 2160
2070 A$=LEFT$(X$,12)
2080 X$=RIGHT$(X$,LEN(X$)-25)
2090 IF LEFT$(A$,1)=CHR$(137) THEN 2170
2100 IF LEFT$(A$,1)=CHR$(129) THEN 2060
2110 B$=RIGHT$(A$,3):A$=MID$(A$,2,8)
2120 B=B+1:IF B=DN*-1.5+2 THEN B=0
2130 IF B=0 THEN PRINT#DN
2140 PRINT#DN,TAB(B*16+1)A$;TAB(B*16+9)".";B$;
2150 GOTO2060
2160 NEXT A
2170 PRINT#DN:PRINT#DN:PRINT#DN,"BYTES LEFT ON DISC";FREE:PRINT#DN
2180 IF DN=-2 THEN PRINT#-2,STRING$(80,"-"):PRINT#-2,CHR$(13)
2190 PRINT"PRESS <ENTER> TO CONTINUE
2200 IF INKEY$<>CHR$(13) THEN 2200
2210 GOTO10
3000 PRINT:PRINT"PLACE SOURCE DISC IN DRIVE"
3001 GOSUB 11000
3005 B=0
3006 FOR A=3 TO 18
3010 SREAD 1,20,A,X$,Y$
3020 IF LEN(X$)<25 AND Y$<>"" THEN X$=X$+Y$:Y$="" ELSE IF LEN(X$)<25 THEN 3110
3030 A$=LEFT$(X$,25)
3040 X$=RIGHT$(X$,LEN(X$)-25)
3050 IF LEFT$(A$,1)=CHR$(137) THEN 3120
3060 IF LEFT$(A$,1)=CHR$(129) THEN 3020
3070 B=B+1
3080 C=INSTR(2,A$,CHR$(0)):IF C=0 OR C>9 THEN ARRAY$(B)=MID$(A$,2,8)ELSE ARRAY$(
B)=MID$(A$,2,C-2)
3090 TYP$(B)="."+MID$(A$,10,3)
3100 GOTO3020
3110 NEXT A
3120 CLS:PRINT"DIRECTORY LOADED":PRINT:PRINT"INSERT MASTER DISC":PRINT:INPUT"NAM
E OF DISC BEING SAVED";NM$
3130 FOR A=1 TO B:FWRITE NM$;ARRAY$(A):FWRITE NM$;TYP$(A):NEXT A:CLOSE
3140 CLS:PRINT"DIRECTORY SAVED":GOTO10
4000 PRINT:PRINT"INSERT MASTER DISC":PRINT:INPUT"ENTER PROGRAM NAME";NM$
4010 FOR A=3 TO 18
4020 SREAD1,20,A,X$,Y$
```

Next comes the file type, stored as three letters; BIN, BAS, BAK and DAT.

Finally, the length of the program can be found by LENGTH=(ASC(MID$(SUB$,15,1))−1×256+ASC(RIGHT$(SUB$,1)).

Function 1 will display the directory of the disk currently in the drive, to either the screen or the printer. If sent to the screen the listing is in two columns, and if to the printer in five.

Function 2 copies the directory of the disk in the drive, and saves it as a file on the master disk. If you are updating an already saved record on the master disk, it is necessary to first KILL the old record. (Function 5.)

Function 3 asks for the name of a program to be found. It then searches all the files stored on the master disk, and then lists all the programs which contain the sought name. It gives both the full name of the programs found, and the disks on which they are saved. For example, the name "ER" would list:

Disk — Games — 1 Prog — KATERPIL
Disk — Games — 1 Prog — DEFENDER
Disk — Games — 3 Prog — DANGER
Disk — Utility Prog — TIMER

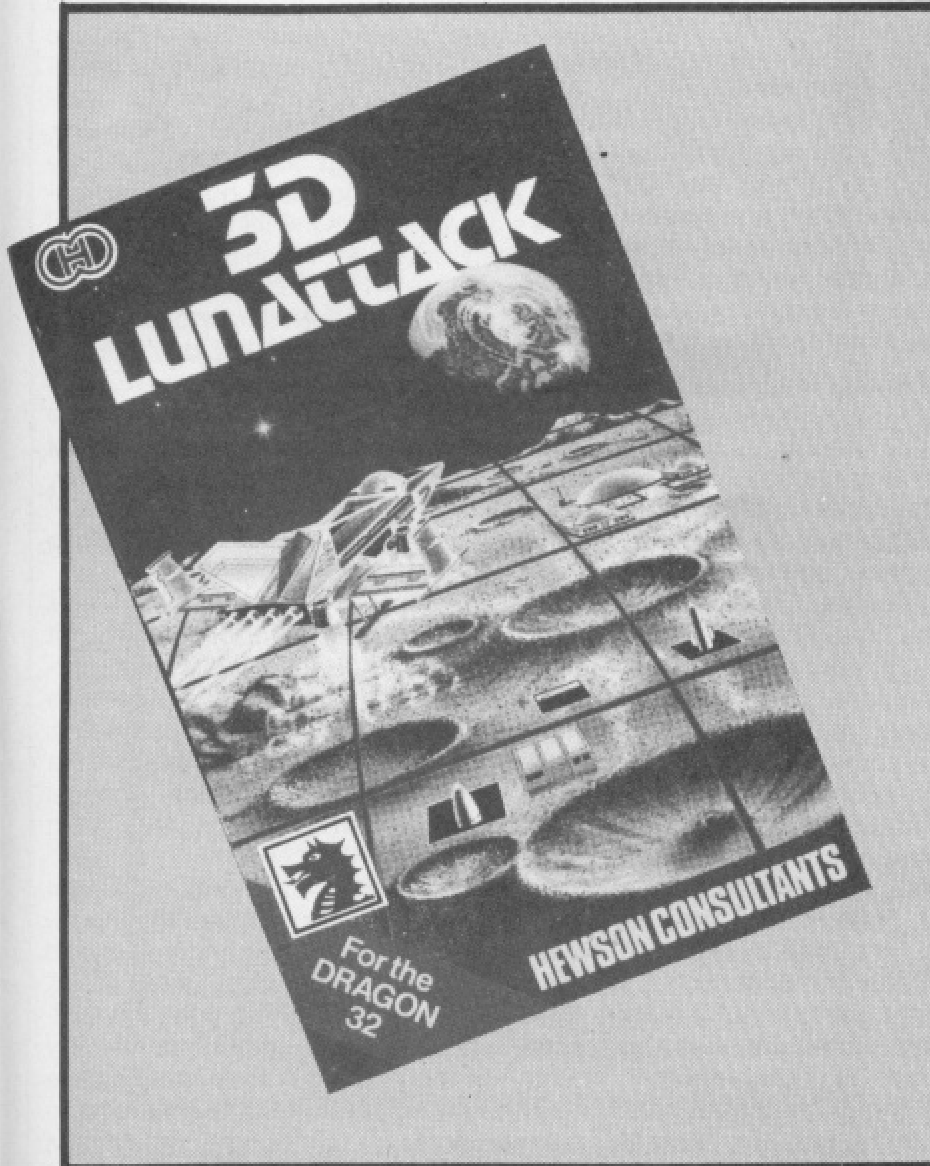
Function 4 asks for the name of a disk file saved on the master disk, and then lists out all the programs stored on that disk.

Function 5 is for KILLing off old directory recordings. Once the name of the file to be deleted has been entered, there is a timed delay of nine beeps during which the KILL can be aborted by pressing any key. The program will then return to the menu. Once a directory has been KILLed it cannot be rescued, so be careful.

The menu is displayed before and after all functions. Prompts are provided throughout.

The program will work with other programs stored on the master disk, but the number of records one can keep is maximised if one keeps the master disk for the control program and its files only.

```
4030 IF LEN(X$)<25 AND Y$<>"" THEN X$=X$+Y$:Y$="" ELSE IF LEN(X$)<25 AND Y$="" T
HEN 4140
4040 A$=LEFT$(X$,25)
4050 X$=RIGHT$(X$,LEN(X$)-25)
4055 IF MID$(A$,10,1)<>"D" THEN 4030
4060 IF LEFT$(A$,1)=CHR$(137) THEN 4145
4070 IF LEFT$(A$,1)=CHR$(129) THEN 4030
4075 B=INSTR(2,A$,CHR$(0))
4077 IF B=0 OR B>9 THEN A$=MID$(A$,2,8) ELSE A$=MID$(A$,2,B-2)
4090 B=0
4100 FLREAD A$;A1$:FLREAD A$;A2$
4110 IF INSTR(1,A1$,NM$)<>0 THEN PRINT"DSC-";A$;TAB(14)"PROG-";A1$;TAB(25)A2$
4120 IF EOF(A$)=0 THEN 4100
4130 GOTO4030
4140 NEXT A
4145 PRINT"SEARCH COMPLETED"
4150 GOSUB 11000:GOTO10
4999 '****SAVED DIRECTORY*******
5000 PRINT:INPUT"NAME OF FILE";NM$
5005 PRINT:PRINT"DIRECTORY DISC ";NM$:A=1
5008 A=A+1:IF A=2 THEN A=0:IF A=0 THEN PRINT
5010 FLREAD NM$;A$:FLREAD NM$;B$
5020 PRINTTAB(A*15)A$;TAB(A*15+9)B$;
5030 IF EOF(NM$)=0 THEN 5008
5040 GOSUB11000:GOTO10
5999 '******KILL DIRECTORY******
6000 CLS:PRINT@8,"DELETE DIRECTORY":PRINT:PRINT:PRINT"ONCE A DIRECTORY HAS BEEN
KILLEDIT CAN not BE RECOVERED!!"
6010 FOR A=1 TO 4:BEEP 2:SCREEN0,1:BEEP 2:SCREEN0,0:NEXT A
6020 PRINT:INPUT "kill WHICH FILE";NM$
6025 IF NM$="" THEN 10
6030 IF RIGHT$(NM$,4)<>".DAT" THEN NM$=NM$+".DAT"
6035 PRINT"PRESS ANY KEY TO ABORT"
6037 A$=INKEY$
6038 FOR A=1 TO 9:BEEP:WAIT300:IF INKEY$<>"" THEN 10 ELSE NEXTA
6040 SCREEN0,1:SOUND1,8
6050 KILLNM$:GOTO10
10000 IF ERR =160 THEN SOUND100,5:SOUND50,2:PRINT:PRINT"NO SUCH FILE FOUND":GOSU
B 11000:GOTO10
10010 PRINT"ERROR....";ERR,"LINE NUMBER";ERL:GOSUB 11000:GOTO10
11000 A$=INKEY$
11005 PRINT:PRINT"PRESS <ENTER> TO CONTINUE"
11010 IF INKEY$<>CHR$(13) THEN 11010
11020 RETURN
11030 '(C) 1985 PETER WHITTAKER
```



THIS month, 20 readers have a chance to win a copy of Hewson Consultants' *3D Lunattack* in a special competition — all you have to do is answer five simple questions, and complete the tiebreaker.

1 Who was the first man on the moon?

..

2 How far away is the moon from the Earth? ....

3 What are the moons of Mars called?

..

4 What was the name of the Greek moon goddess?..

5 In what film was a strange monolith found buried on the moon?.....................

As a tiebreaker, in 12 words or less, say why you would like to win a trip to the moon.

Send your entries to Hewson Competition, Dragon User, 12/13 Little Newport Street, London WC2H 7PP. Competition closes September 1.

Name..

Address ....

..



SEVERAL letters from readers recently have bemoaned the lack of Dragon software in the shops, and adventures suffer particularly badly in that respect with most distributors giving the impression they wouldn't touch text-only adventures while wearing rubber gloves. Other readers have asked about bargain-price adventures, such as Mrs Maureen Adams of Warley in the West Midlands, so combining the two subjects I'll have a look this month at three older but interesting titles available from Touchmaster for only £1.99 each (plus £1.50 P&P per order).

Gullible guards

Final Countdown gives you the comparatively simple task of preventing World War III, and you do this by stopping a mad general from launching a nuclear missile. You begin the game outside the missile base in a van, and a good hunt round here will provide you with the means of getting past the rather gullible guards on the main gate.

The adventure isn't exactly heavy on authenticity, for example, look at the Bulletin Board which contains only a note saying "Watch your step on stairways," but it's not at all bad. You can wander round various supply rooms, computer rooms and offices, hopefully finding the secret stairs up to the command centre, and beyond that through the obligatory maze to the launch control centre.

Here, as elsewhere, you're faced with a panel of buttons but you have no idea as to what the outcome of pressing each button might be. You might be doing the mad general's work for him, going down in history as the person who started World War III, but if you don't do something you're in trouble anyway as the general himself turns up after a certain number of moves (seemingly dependent on which of the three skill levels you choose) so this one is more a race against the clock.

There's no SAVE routine, but it's an unprotected BASIC program with over 12K of memory left so the more adventurous adventurers might try to incorporate one of their own. By no means a heavyweight adventure, but it should keep beginners entertained and puzzled for quite a while, and even the adventure-starved experienced player might like to try it at that price.

The next title shows that we adventurers obviously haven't been pulling our weight lately, because there are still scores of undead creatures around, the latest being Count Van Steinoff in his *Mansion of Doom* in Transylvania. I thought we'd have killed them all off by now, but seemingly not, and now the Count's gone and kidnapped Crown Princess Marlena. Female adventurers must use their imagination, and pretend they're rescuing some dashingly handsome prince.

The Count's mansion is positively awash with garlic, silver bullets, wooden stakes, hammers and all the other trappings familiar to vampire hunters everywhere, but there are also lots of extras and this was my favourite of the Touchmaster titles. There are plenty of locations available to you at once, on the various floors of the mansion, and you're not faced with insurmountable problems before you've even started.

There is an early problem, which is how to stop the candle blowing out when you reach the stairs leading to the lower levels, but you can forget about that and go upstairs instead where there are dozens and dozens of rooms. Hidden somewhere in one of these is a watch, which you can examine to see how it's ticking away towards sunset (the time of which you're given elsewhere).

Rancid rooms

Also available for examination is a map, but quite what it's a map of I don't know as it's written in Transylvanian, as are many notices around the place, and I haven't yet figured out how to use my Transylvanian dictionary from the library. With rancid rooms, rooms full of worms and rooms smelling of decaying flesh, this is definitely not one to play while you're eating your supper, but it's one you should try to look at as it's about the best Dragon Dracula adventure I've seen, using up almost all the available memory.

The final title this month is actually two for the price of one, *Stalag/Eno. Stalag,* as you might imagine, is a case of escaping from a prisoner of war camp, though it's not the enemy you've got to watch out for because the camp has been deserted and is about to be bombed by your own side in order to obiliterate it. It was your bad luck to get yourself put in the Hot Box, used to welcome new prisoners, and then forgotten about as the camp was abandoned. As you explore the various barracks and open area in the camp, you are ominously reminded of your time running out by the sound of planes flying overhead from time to time.

Baseball bat

In the shower hut there's a drain grating, but it's rather stubborn and won't move, while alongside it is a piece of leaking plumbing which I've been trying to use to fill a nearby bucket, though what I'll do with it if I manage it I'm not sure. In an attic I've found the power switch for the fence . . . but would the departing guards have left it switched on or off? And what use is the baseball bat and the football? *Stalag* doesn't support a very extensive vocabulary (in fact none of these games do) and you'll have to make regular use of the verb EXAMINE, with concealed objects sometimes concealing other objects.

Turn the tape over and you've got *Eno,* the first puzzle here being what does the title mean? I've no idea, but the adventure's as unusual as the title, being the first one I can remember which takes place in a single location! The story is that your rich aunt has died and left her fortune to you, provided you can find it. It has been hidden somewhere in the living room, which is where the whole adventure seems to take place. There are fifteen different areas of the living room that I've found so far, unless there are secret passages . . . goodness, the place doesn't even seem to have a door!

It does have lots of rugs, chairs, lamps and other everyday objects, and while it recognises the verb MOVE I've tried moving everything but nothing ever seems to happen. There are lots of items concealed, a TV set that's showing *Alien,* and a picture of your aunt's cat which I thought might protect me from a lurking rat . . . but it didn't.

There's also lots of dry humour lurking in the terse responses to some of the inputs. Examine the stuffed chair and you're told "It clashes with the curtains," while LOCK WINDOW produces "There goes the mailman." Those maybe don't sound very funny on the page, but their brevity gave me a few laughs when I'd been hoping to uncover some helpful clue. If you want an

adventure that's intriguing, then try *Eno,* though I was pleasantly surprised by all these Touchmaster titles.

Another bargain on offer, which I've mentioned before, is *El Diablero* from Microdeal at 99p plus 50p postage. I don't usually bother giving the addresses of companies like Microdeal, whose adverts are always in the magazine, but as some readers still write in and ask about them I shall tell you that they're at 41 Truro Road, St Austell, Cornwall. If you are already an *El Diablero* fan then you'd be interested in the newly formed Adventurers Club Ltd, details of which are on the news pages this month. Their first lengthy newsletter included a detailed look at the devilish *El Diablero,* going through the game but giving veiled hints rather than answers to problems.

Too many readers' this month to mention them all, but several people did write and ask for the help sheet on *Madness and the Minotaur,* which I offered in exchange for s.a.e. a couple of months ago. Those have gone out, though they are only hints rather than solutions, but I hope they have come in useful.

Lots of help offered on *The Cricklewood Incident* by Paul Watson of Newcastle, who has actually managed to complete that wretched game, the one which has driven many of us batty. I'll be printing some of Paul's clues next month, space permitting, and perhaps making a typed list available for anyone who's interested — send s.a.e. if you are.

Tips on *Ring of Darkness* from Neil Bowden of Falkirk, for those having difficulty crossing water or mountains. Just keep plugging away at increasing those experience points and you'll find that the shops in the towns closer to the obstacles will start to offer you more interesting items, like rafts and mules. If you're extremely frustrated or just plain dishonest, Neil says BREAK into the program and type **CH(n)** = **CH(n)** + **x,** where **x** is the number of additional points you want, with **n** 4, 1, 2, 3, 5, 8 or 9 to represent respectively your present level, IQ, strength, agility, hit points, experienced or gold. Then type **GOTO 4450** to resume play.

Even with extra space there's no room to deal with all this month's letters in the column, though everyone will get a reply. If you do write, just bear in mind that Sunshine Publications gets a mountain of mail every day and therefore it does take time to sort all the letters and get them to the people concerned. If you have to wait a while, that's the reason.

I have to find room for one final letter, though, from Mathew Lodge, giving help to those frustrated by the lack of a SAVE feature in *Madness and the Minotaur.* Mathew says you should type **QUIET (ENTER)** then press **BREAK** once. Start the cassette recording, then press the **!** key. To LOAD what you have saved, type **QUIET (ENTER),** then **BREAK** key once, then the **(** key (SHIFT 9) and the motor will start and the game will load. He's also discovered that typing BACK is useful in the maze and beyond blocked doors. So a final thanks to Mathew for taking some of the madness out of *Madness and the Minotaur.*

Adventure Helpline

To help puzzled adventurers further, we are instituting an Adventure Helpline — simply fill in the coupon below, stating the name of the adventure, your problem and your name and address, and send it to Dragon User Adventure Helpline, 12/13 Little Newport Stret, London WC2H 7PP. As soon as enough entries have arrived, we will start printing them in the magazine.

Don't worry — you'll still have Adventure Trail to write to as well!

Adventure ....
Problem..
....
Name ....
Address..
.... **Aug 85**

If you've got a technical question write to Brian Cadge. Please do not send a SAE as Brian cannot guarantee to answer individual inquiries.

Dragon Answers

Cayman query

IN THIS part of the world there is a tremendous amount of software for the TRS-80 Color Computer. I would like to take advantage of this.

Recently I bought my first CoCo ROM Cartridge, but when inserted into my Dragon 64 there wasn't any response.

Could you please outline to me why this doesn't work, or if there is a general problem in using CoCo Rom Cartridges with the Dragon. If so what can be done to remedy the problem?

Finally, is the Disk format of the Color Computer the same as Dragondos, and will the former's disk software work on Dragondos drives?

K Owens
PO Box 1857
George Town
Cayman Islands
BWI

WITH Dragon software becoming increasingly difficult to find in the high street everywhere it is worth printing the list of Tandy cartridges which will work with the Dragon computer. These are: *Skiing, Colour Backgammon, Tennis, Slay the Nerius, Galactic Attack, Androne, Space Assault, Dino Wars, Project Nebula, Chess, Super Bustout, Roman Checkers, Wildcatting,* and *Bingo Math.*

All of these will work with the Dragon with the exception of some the 'save game' facilities in some of them (such as *Chess*). Our thanks to Peter Franchi for preparing this list for us.

Dragondos disks are not compatible with CoCo disks.

Circuits

WHERE CAN I get a copy of the circuit diagram for the Dragon 64?

E C Karklins
Lonlas House
Lonlas
Skewen
Neath SA10 6SD

FOR ALL those readers that fancy trying their own repairs or modifications, circuit diagrams, previously only available from Dragon Data, can now be obtained from Compusense. As the circuitry for the 64 is different from the 32 you should state which micro you have when ordering. They cost £2.99 each. Compusense can be contacted on 01-882 0681.



Error— or not?

WHILE tinkering about with my Dragon 32, I happened to type in PRINT POS (−1). This gave me an error in the form ?ND ERROR. I have never heard of this one, so I checked my manual and sure enough it wasn't there. Could it be an operating system bug? An unlisted bug? What do you think it is?

Also, is it possible using machine code to get all nine colours in PMODE 4 on the Dragon?

Jonathan Thomas
Mid Glam

THE POS function returns the current horizontal print position of the given channel. POS (0) gives the column of the text cursor, POS (−2) gives the column of the lineprinter, and POS (−1) should give the 'column' of the cassette buffer position.

The NO ERROR you get stands for Not Open and is in fact mentioned in the manual. This occurs because you have not used an OPEN command. If you try OPEN "0",−1," " and then type ?POS (−1) you will get a zero returned and no error. In fact the POS function always returns a zero with the cassette channel and so is of little use to the Basic programmer.

In PMODE 4 the hardware will only allow the use of two colours, black and green, or black and white.

Hash bug

I AM the manager of a heat transfer equipment design and manufacturing company and have adapted a Dragon 64 computer with OS9 system for thermal and code calculations of our products.

We are actually trying to use the system to make our cost estimations and to this end we accumulated our equipment data in database files with the OS9 R.M.S. (record management system).

Unfortunately the hash coding algorithm listed on page 43 of the Dragon Data R.M.S. manual does not seem to work and we are not able to retrieve the records from the files.

I will be very much obliged if you could get me the correct algorithm for hash coding of the rms key fields to permit us to exploit the remarkable features of the OS9 system to their full extent.

Y Carasso
Israel

THE BUG in the R.M.S. hash coding program is on the eighth line up from the bottom, which should read as follows;

```
N=N+C−$20\(*alternate chrs
in M and N
```

Making this adjustment should mean that the program will run without any further errors.

M/c auto

COULD YOU tell me how to get my machine code programs to run automatically on loading. I know it must be difficult as both *Your Computer* and *Dragon World* have shied away from the subject.

Paul Cleary
Milnthorpe

ONE OF the simplest ways to autoturn machine code programs is to use the program below. Your machine code program should be located low down in memory (perhaps stored in the graphics pages starting at 1536), it can, if necessary, relocate itself into high memory once loaded.

The first instructions in your code *must* be:

```
LDA  #57
STA  359
LEAS 2,S
```

this resets the print vector which is used to autorun the program. The screen displayed when saving will also be displayed when re-loading the program (using CLOAD).

```
10 INPUT "FILENAME";F$
20 INPUT "END ADRS";EN
30 INPUT "EXEC ADRS";EX
40 CLS:PRINT@263, "LOADING
   PROGRAM..."
50 MSB=INT (EX/256):LSB=EX
   −MSB*256
60 POKE 359,126:POKE 360,
   MSB:POKE 361,LSB
70 CSAVEM F$,359,EN,EX
80 POKE 359,57:END
```

M/c run

COULD YOU please tell me the machine code routine for "RUN" a basic program which has been saved on a disk (the equivalent of : RUN"PROG. BAS").

Gaston Ulric
Equemauville
France

THE following assembly code will load and run a program, machine code or Basic, from disk. The filename given must include the quotes and there must be a zero byte after the closing quote.

```
        LDX #FNAME
        STX 166
        JMP $D4A4
FNAME   FCC 34,/FILENAME.
        BAS/,34,0
```

FINALLY, a note regarding my answer to Simon Buxton in the June issue. I mentioned there was a need for a Disk Doctor type of program for Dragondos.

Since then a number of readers, including Martin Walsh and S Parker have written to tell me about a program called *Disk Utilities* by Ian Elkington. This program is available for £10 and includes nine simple utilities, including sector editing, viewing and disk to cassette backup. Ian Elkington can be contacted at 11 Wharfdale Gardens, Baildon, Shipley, W. Yorks.

Classified

DRAGON SOFTWARE for sale. Over 50 titles including the King, ATC, Cuthbert titles and Tim Loves Cricket. For price list sae to Raymond Gibbs, 72 Meadow Road, Southborough, Tunbridge Wells, Kent.

DRAGON LISTING SERVICE 30p per program, CWO plus sae. Hi-res screen, dumps, trial runs, cheques payable Rogalog, 4 York Street, Newcastle 4 NE4 6ET.

DRAGON 64 plus disc drive, as new, Edit Plus, 51 x 24, 6 months old, £300. Wroxham 3957, Norfolk.

CHEAP DRAGON SOFTWARE and hardware sale. ring 021-744 6530.

DRAGON-DOS TWIN 5¼in. drives, Telewriter word processor, moneybox personal accounts, head cleaner, blank disks, manuals, etc. incl. Two months old. £300. Phone 077385-2947.

DRAGON 64, Dragon drives, all 059 software, Forth, many games, joystick, £400. May split. Welwyn 4454.

DRAGON SOFTWARE LIBRARY. Life membership only £6.00. Two weeks hire £1.00. Stamp for details to DSL, 6 Neptune Terrace, Sheerness, Kent ME12 2AW.

DRAGON 32 HITEXT. Place text on the Hi-res screen with this machine. Language, utility features, full upper/lower case, reverse field and double height characters, 51 x 24, 32 x 24 displays, 16 CLS colours, 6 display modes, £4.95. Super basic (all Dragons). A machine language utility adding 58 commands to Basic. Features include 4-channel sound, alarm clock, function keys, procedures, error trapping, 33 colours, auto run on loading, plus lots more! £4.95 to R. Thompson, 7 Brindley Way, Southall, Middlesex UB1 3JN. Tel: 01-571 3610.

DRAGON ACCESSORIES. Edit plus cartridge £20. Complete set (−1) Dragon User £10. Various books, cassettes. Phone for details (0562) 743968.

MCP40 PRINTER for Dragon with three rolls paper and pens. Boxed. Swap for Brother HR-5 for Dragon. Tel: (0706) 31239.

CUMANA DISK-DRIVE, Controller plus tool kit, 60 extra commands worth £290 only £190. Flex D Basic system only £50. 0327-703060.

PROGRAMMERS. Have you written a superb machine code game that could be this year's Christmas best seller? We offer superb royalties and excellent marketing. Write quickly for free evalution in strictest confidence with no obligation. Oron Software, 64 Prince Street, Rochdale, Lancs.

CASPIR ANALYSES TAPES and displays format. 100% m/code. £2. A. J. Schofield, 11 Queens Road, Chandlersford SO5 1AH.

FAMILY PACK. 3 programs for £3. BIOCHART to check your biorhythms. SKETCHER to draw in any PMODE, plus save facility. PIT STOP for 100% Machine Code car race allowing 2 players at same time and up to 9 other cars. Send £3 to M. Cupit, 4 Mary Armyne road, Orton Longueville, Peterborough, PE2 0DR.

DRAGONDOS EPROMS reprogrammed to include patches described in *Dragon User* May '85 (plus corrections). Send your Dragondos Eprom (£5) or cartridge (£5.50) to P. G. Scott, 4 Badgerwood Drive, Frimley, Camberley, Surrey GU16 5UF.

CAR FAULT DIAGNOSTIC program, 42 character, hi-res display, no motorist can afford to be without one, only £3.00. R. Reilly, 50 Dymokes Way, Hoddesdon, Herts, EM11 9NB.

DRAGON SOFTWARE LIBRARY. Life membership only £6.00. Two weeks hire £1.25. Stamp for details to DSL, 30 Waterside View, Leysdown, Sheerness, Kent ME12 4N.

DRAGON SOFTWARE 33 games plus compiler plus sound utility plus books. The lot £90 ono. Will split. Tel: Luton 450462 after 6 pm.

DYNACALC and record management system discs, RRP £114.90. Sell £25.00 each ono. Stafford 822248. New.

DRAGON 32K computer leads games, £55. Phone after 5 pm or weekend. 01-986 2658.

DRAGON 32 GAMES, books, monochrome, 11in. TV, cassette recorder, £100 ono. Tel: Bristol 324743.

Here's my classified ad.

(Please write your copy in capital letters on the lines below.)

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£1.00	£1.20	£1.40	£1.60
£1.80	£2.00	£2.20	£2.40
£2.60	£2.80	£3.00	£3.20
£3.40	£3.60	£3.80	£4.00
£4.20	£4.40	Please continue on a separate sheet of paper	

I make this.................................. words, at 20p per word so I enclose..................................

Name..

Address..

....

....

Telephone..

Please cut out and send this form to: Classified Department, *Dragon User*, 12-13 Little Newport Street, London WC2H 7PP

Get set to win Jet Set Willy!

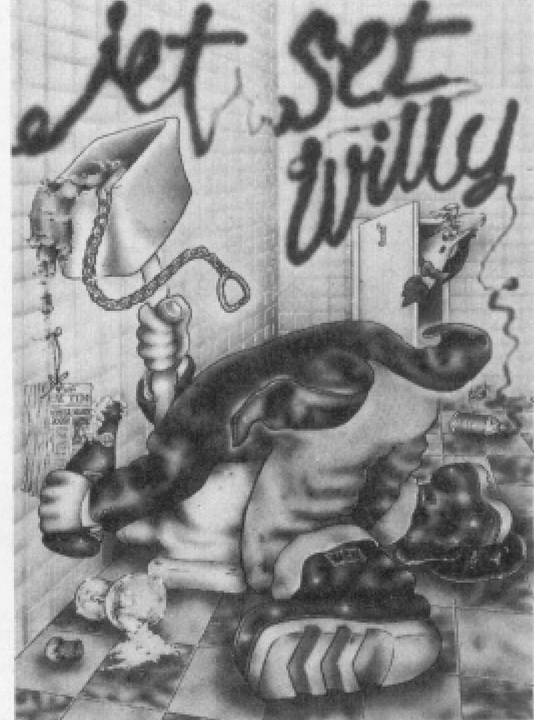
***Gordon Lee** sets another mathematical conundrum — Software Projects' Jet Set Willy is the prize*

THINK of a number — that is, any positive whole number. If the number is even, divide it by two. It it is odd, multiply by three and add one. This will give you a new value on which you repeat the same operation as before. This is then continued until a specific endpoint is reached.

But what is this endpoint? There are, it would seem, three probable outcomes to the exercise. Either the number will increase without limit, or possibly, it may decrease until it reaches the value of one. Alternatively, there is a third possibility — somewhere during its operation, it may happen upon a value that has already been reached. If this should happen, thereafter it would be bound up in an endless loop of repeating numbers.

You might expect that any one of these possibilities might occur, depending perhaps on the intitial value chosen. This is not so. All numbers so far tested by this method will eventually terminate at unity — although it must be stated that there is, at the present time, no rigid mathematical proof that this is the case for *all* numbers. This lack of a proof, together with the necessity to perform a rapid sequence of calculations, has resulted in this problem recurring from time to time in computer literature. All starting values from 1 to 240 — a thirteen digit number — have been tested by computer and all invariably reduced to one in a greater or lesser period of time.

Let's take a couple of easier examples and see how the problem works out. If we take as our standing value 26, we get the series: 26, 13, 40, 20, 10, 5, 16, 8, 4, 2, and 1. Similarly, with 28 we get: 28, 14, 7, 22, 11, 34, 17, 52, 26, 13, 40, 20, 10, 5, 16, 8, 4, 2, and 1 — a slightly longer series this time, but again with the same eventual result. However, if we were to start with 27, the series would not finish until after 111 steps, during which time the largest *number* reached in the series would have been 9,232. This prompts a second question within the original problem. For a given number (N), is it possible to predict mathematically both the eventual path length (L), or the maximum value reached during the operation (M)? So far, the answers to



these questions remain something of an enigma, and it is mainly as a result of computers working out these values experimentally that an idea of their nature is known. Taking just the three examples already mentioned, figure 1 at the foot of the page below shows something of their capricious nature.

Readers who wish to pursue their own lines of enquiry might find the following program useful for calculating these values:

```
10 INPUT "STARTING VALUE" ; N
20 Z=N : S=0 : M=N
30 IF Z=1 THEN GOTO 70
40 IF Z/2 = INT (Z/2) THEN Z=Z/2 :
   S=S+1 : GOTO 30
50 Z=Z*3+1 : S=S+1 : IF Z M THEN
   M=Z
60 GOTO 30
70 PRINT "VALUE"; N; "HAS A PATH
   LENGTH OF"; S
80 PRINT "AND A MAX. VALUE OF " ; M
90 GOTO 10
```

If a few figures are worked out it will be seen that, except for a few generalised examples, there is no correlation between any value (N) and its corresponding S and M values. The only predictable values are powers of 2 where 2^p is its own maximum value, and has a path length of *p*.

If these relationships are studied more closely, certain other enigmatic properties become tantalisingly apparent. For example many numbers share the same path length, and whole groups of numbers reach the same maximum value. Indeed, certain consecutive numbers can even share the same path length and maximum value. This month's competition is to find not two but **five** consecutive numbers with this property. There are many such sets, but which is the smallest?

Figure 1 — path length and maximum values

Number (N)	No. of steps (S)	Max. value reached (M)
26	10	40
27	111	9232
28	18	52

Prize

FIFTEEN readers can win themselves copies of Software Projects' famed arcade game *Jet Set Willy,* the follow up to *Manic Miner.*

Rules

TO WIN a copy of *Jet Set Willy,* you must both show the answer to the competition and how to solve it with the use of a Basic program written on your Dragon. Please do not send in a cassette containing your answer. Please also make sure your name and address are printed clearly on your entry, and mark the envelope August competition.

As a tiebreaker, invent names for three *Jet Set Willy* type games — the funnier the better.

Your entry must reach *Dragon User* by the last working day in August. Winners will be announced in the November issue. The editor's decision is final, and no correspondence will be entered into.

May Winners

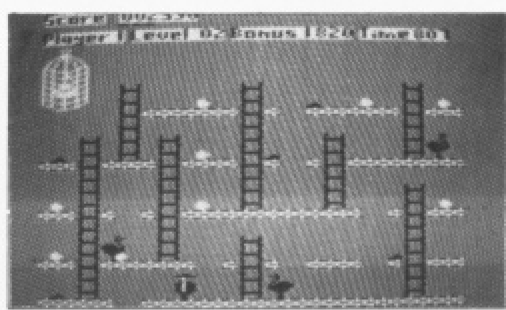
THE FOLLOWING people won *Sprint Basic Compilers:* Adrian Shuttleworth of Wakefield, Kevin Jones of Pontlottyn, M J Fell of York, M McDonough of Fleetwood, E J Wells of Deal, P Blewett of Carleton, J Thomas of North Walsham, R Morris of Rogerstone, S Holt of Bacup, F Willers of Stone, R Bootman of Oakley, Rachel Edmunds of Sedgefield, Pål Gørnås of Norway, C J Smith of Chelmsford and Simon Cayuela of Blois.

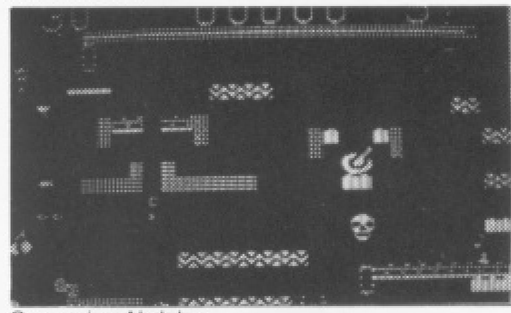
They will be receiving their copies of Sprint soon.

Two more great games from A'N'F.

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SCREAMING ABDABS

DRAGON
CHUCKIE EGG


Chuckie Egg


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Monsters, screws, scissors and even food will impede your passage through this multi-screen game. Our hero must negotiate his way through the 35 complex screens, collecting the key to the next level on the way. There are numerous traps and monsters to hinder your progress, which include icicles, screws, drinks, food, scissors, electric walls, moving platforms, collapsing floors, balls, conveyor belts and many more.

By skilfull use of the platforms, walkways and the switches you might survive to level 34, then you have the challenge of the penultimate last level – only the experts will make it.

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- **7 day Money back Guarantee.**

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The smooth control of the Voltmace delta sprung return joystick is now available to Dragon owners. Each joystick has been individually tested before it leaves our factory, following extensive robot testing to prove the design (we tested it more than a million times). This means that not only will your joystick be strong, tough and reliable, but it ensures long life, accurate control and with the choice of red or green fire buttons, gives instant recognition between the left and right joysticks.

If you are not completely satisfied with the delta 3d, return it to us within seven days for a full refund.

Dragon dealers come out of your caverns!

More stockists required in some areas.



Made in England

DELTA 3d JOYSTICK £10.00
TWO DELTA 3d JOYSTICKS £19.50
PLEASE STATE COLOURS REQUIRED

Prices include VAT and P&P.

Voltmace *delta 3d*

VOLTMACE LTD
PARK DRIVE
BALDOCK
HERTS
SG7 6ED
Tel: (0462) 894410



Callers welcome at the factory — Monday to Friday.